NETWORK WORLD
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CONFERENCE PREVIEW

CMA members take aim at top slots

Managers seek career guidance.

BY JIM BROWN
New Products Editor

UNIONDALE, N.Y. — Jockeying for better position in the corporate hierarchy and coping with the seemingly never-ending changes wrought by the divestiture of AT&T are among the chief concerns of the communications chieftains attending the eighth annual gathering of the Communications Managers Association (CMA) starting here Wednesday.

An expected 500 managers — representing the CMA's 190 member firms — will be working to develop the skills needed to meet the new challenges facing communications managers.

Members also told *Network World* they are keenly interested in learning about cost-saving services and ways to increase equipment utilization.

To meet those needs, CMA President Hollis Sobers said the CMA's Annual Conference and Telecommunications Exposition will feature a blend of sessions focusing on management, regulatory and technical topics.

"We are hopeful we can leave the conference with the added incentive to improve our positions," Sobers said.

"We would like to see telecommunications managers not be stereotyped as technicians and passed over when there is opportunity for advancement within the corporation."

CMA members, which spend at least $1 million annually on telecommunications services, have seen their positions change since the organization was first formed in 1948.

The manager of yesterday typically had a techni-

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NETWORK LINE

News

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Bargaining with vendors may be the best way to stay out of court when it comes to using copyrighted software on a local-area net. Page 45.

NEWSPAPER

NORTHERN TELECOM

PBX rental plan threatens telcos

BY JOHN DIX
Senior Editor

Northern Telecom, Inc. is implementing a marketing program that will end up pitting giant corporations such as Electronic Data Systems Corp. (EDS) against local telephone companies by helping the newcomers establish telecommunications management services.

Under Northern Telecom's Telecommunications Facilities Management (TFM) program, companies such as EDS, distributors and selected large accounts will buy equipment from the switch maker to rent to users as part of a package that includes ongoing maintenance, support and manage-

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MAJOR MERGER

Comsat, Contel consolidate

Contel to pull the strings as a Comsat subsidiary.

The Contel-Comsat matchup

	CONTEL	COMSAT
Revenue for 1985	$2.6 billion	$459 million
Earnings for 1985	$239.9 million	$103.9 million
Number of employees	21,900	2,393
Product lines	• Telephone operations • Information systems • Business systems • Federal systems	• International satellite services • Private satellite networks

BY PAM POWERS
Senior Editor

ATLANTA — Communications Satellite Corp. (Comsat), one of the largest domestic satellite service providers, last week agreed to merge with Contel Corp., a multibillion dollar telephone company, in an unusual deal that would make the much larger Contel a wholly owned subsidiary of Comsat.

While Comsat will retain its name, Contel executives will dominate the management structure of the merged firms, which have combined assets of $6.6 billion, $5.4 billion of which are contributed by Contel. Contel was made a subsidiary of Comsat in order to get around federal restrictions that prohibit the sale of the company. The restrictions were imposed because Comsat's international satellite business services the public.

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FEATURE FOCUS

Intelsat's Richard Colino candid on competition

BY CHRISTINE CASATELLI
Assistant Features Editor

LAS VEGAS, Nev. — Richard Colino is the Dag Hammarskjold of the satellite communications industry — outspoken, controversial and concerned for the good of the whole.

As director general and chief executive of the International Telecommunications Satellite Organization (Intelsat), Colino presides over the world's largest nonprofit satellite cooperative.

Colino's unique task is to make sure signals transmit freely among Canada, Rwanda and the rest of the 112-nation membership. The interference he encoun-

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▶DOCUMENT DISTRIBUTION

Stung Federal Express scraps Zapmail service

Ambitious Vsat strategy is reconsidered.

BY BOB WALLACE
Senior Writer

MEMPHIS, Tenn. — After suffering losses exceeding $317 million, Federal Express Corp. last week said it will junk its Zapmail electronic document transmission service next month, less than three years after its introduction.

Industry sources claimed Zapnet, the packet-switched network built to handle Zapmail traffic, was responsible for the failure of Zapmail. The network reportedly was too slow and was not designed to handle the volume of traffic necessary to make Zapmail profitable. Federal Express has already begun to dismantle the network, which featured a dozen nodes linked by 56K bit/sec leased lines.

A Federal Express spokesman said the company is also reevaluating its plan to implement what would have been the world's largest very small aperture terminal network. The company had planned to sink more than a billion dollars into the Zapmail project during a 10-year period. As part of that investment, Federal Express planned to construct a 25,000-Vsat net designed specifically to support the Zapmail service in future years. The company had planned to mount Vsats on or near the facilities of users who would frequently use the Zapmail service.

Implementation of the Vsat net would have necessitated the launch of a Ku-band communications satellite, dubbed Expresstar. Federal Express has not canceled its contract with Martin Marietta Corp., which recently announced it would launch Expresstar in 1989.

In Zapmail's initial form, a courier would transport a customer's documents to the nearest Federal Express office. The literature was then transmitted via facsimile machine to the Federal Express facility nearest to the recipient's site for

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▶LOCAL NET WIRING

Fiber gaining user favor

BY MARY PETROSKY
West Coast Correspondent

Bolstered by lower prices and an arsenal of new fiber net connections, fiber-optic cable is winning ground from coaxial cable and twisted-pair wiring on the local network battlefield.

Fiber has been viewed by many as a high-cost alternative to other, more easily implemented solutions. However, although market research indicates that fiber-optic cable currently accounts for only about 1% of the cabling used in installed local-area networks, user interest in this flexible medium is growing steadily. Some researchers say the light-wave medium may account for 40% of local net cabling within five years.

"We're seeing an increasing demand for fiber-optic cabling. The interest was never there before," said Harvey Freeman, vice-president of Architecture Technology Corp., Minneapolis, consultants and specialists in computer architecture. Many large companies have already put in fiber, Freeman said, and a number of medium-sized firms are going the same route.

In many cases, fiber is proving more attractive than coaxial cable and twisted-pair wiring because it takes up so little space and provides high bandwidth, Freeman said. Also, as a wider range of fiber connections for various personal computer local nets becomes available, users are finding it easier to mix and match cabling, he said.

A number of users are testing the fiber waters by installing light-wave cable as a backbone between buildings in a campus setting. As part of a recently signed $21.8 million contract with AT&T, the University of Southern California will have a ring of fiber-optic cabling placed in the middle of each of its two campuses, said Paula Thomas, associate vice-president for business affairs. Cabling will then be run from the rings to each of the 185 individual buildings on the campuses. Buildings housing users with heavy data transmission requirements will be connected to the ring via fiber, while other buildings will be linked with twisted-pair wiring. All in-building wiring will be twisted pair, Thomas said.

"We do have some high bandwidth needs that aren't going to be met by this in-building wiring system," Thomas said, citing as an example the university's research facilities, which easily could use 5M or 6M bit/sec of bandwidth.

Flexibility was a key reason Southwestern Bell Telephone Co. opted to put fiber-optic cabling in its new corporate headquarters in St. Louis. According to Dave Stein, staff manager of corporate communications, Southwestern Bell has installed fiber throughout the

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COMMUNICATIONS MANAGER

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NEW PRODUCTS AND SERVICES

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FEATURES

First users of IBM's Token-Ring Network admit problems with the system, but still see it as a long-term contender. **Page 49.**

▶PROTOCOLS

Sun adds new link equipment

Products support MAP, X.3 and more.

BY MARY PETROSKY
West Coast Correspondent

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. is expected today to unveil additions to its line of data communications products that allow a single Sun workstation to support a variety of protocols. The products give users access to a range of other vendors' equipment and support communications between Ethernet (802.3) and token-passing bus (802.4) networks.

The new products provide connections between Sun workstations and Digital Equipment Corp. computers and support the Manufacturing Automation Protocol and protocols that allow Sun workstations to act as nodes on the Defense Data Network (DDN). In addition, Sun announced support for X.3 and X.29 protocols, which govern how information is handled between terminals and packet assembler/disassemblers. By supporting these protocols, Sun has expanded the number of systems its workstations can communicate with on a public data network.

Sun's networking strategy to date has focused on support for Ethernet and the Transmission Control Protocol/Internet Protocol (TCP/IP), developed by the Defense Advanced Research Projects Agency (Darpa). Both Ethernet and TCP/IP are supported by each Sun workstation. The company has already offered links to IBM mainframes and communications between computers running TCP/IP on an X.25 network as well as support for the Technical and Office Protocol, all of which run over Ethernet. By supporting MAP protocols, Sun is now providing its workstation users with access to token-passing broadband nets.

"One of the real strengths of the Sun networking architecture is that you have one Ethernet cable, but you have the option of running the Decnet, TCP/IP or OSI proto-

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▶ T-1 INDUSTRY

NSS faces legal wrangle

BY PAUL KORZENIOWSKI
Senior Editor

BOSTON — A former employee of Network Switching Systems, Inc., a start-up company in Andover, Mass., is waging a legal battle against the company, claiming that NSS misrepresented its ability to deliver its NSS 16, a high-end T-1 multiplexer.

In May, Richard J. Malone brought suit in federal court here charging NSS with deceit, fraud and misrepresentation. Malone is seeking damages for lost value of NSS stock, lost salary, lost commissions and lost stock options, according to documents filed in the case.

In the spring of 1984, Malone was New England district sales manager at Tymnet/McDonnell Douglas Network Systems Co. During the summer, NSS founders Alan P. Zucchino and Harry W. Ruda, former Tymnet employees, recruited Malone.

Malone claimed that he was lured to NSS by 20,000 shares of founders' stock. Founders' stock is issued to employees when a company is incorporated. Typically, the percentage of shares an employee owns increases during his company tenure. Should an employee leave before a specified time, the company can buy back the stock.

Zucchino and Ruda said that in three years' time Malone's stock would be worth $1 million, according to the suit. The NSS founders also claimed the company was ahead of its production schedule. A beta test of the NSS 16 was scheduled for January and production shipments slated for July 1985.

Malone joined NSS as Northeast regional sales manager in September 1984. Upon arrival, his budget was cut, and he was left with no employees to manage. A month later, a senior engineer told Malone that NSS would not meet its shipment dates, the suit states.

At the time, NSS was preparing for a round of financing and Malone was told to sign up beta customers even though no resources were devoted to developing key product features. Three companies agreed to test the product, according to the suit.

In December 1984, the beta test and production shipment dates were pushed back. Zucchino admitted that a new engineering director had to be hired before investors would commit to another round of financing, the suit alleges.

Because of the uncertainty, two beta sites withdrew and bought products worth more than $44 million from NSS competitors, the suit states.

In the second round of financing, Infotron Systems Corp. invested $3 million in NSS and agreed to beta test the NSS 16. Also, a new vice-president of engineering was hired.

Shortly after the vice-president began work, he informed Zucchino that the production schedule was in worse shape than anticipated, the suit states. Beta shipment dates were moved back to November 1986 and production shipments to July 1987.

In January 1986, Malone resigned. NSS excised its option and purchased 90% of Malone's stock. Malone sold the company the other 10%. He paid $2,000 for the stock and sold it for $8,500.

The suit charges that Zucchino used NSS funds, facilities and employees to support his own consulting business. In the summer of 1985, Zucchino prepared a packet-switching study for Bell Communications Research, Inc.

Representing NSS, Bernard J. Bonn, partner at Testa, Hurwitz & Thibeault, a Boston law firm, vehemently denied all charges.

Bonn dismissed the charges as hollow claims by a disgruntled ex-employee. He said the dispute centers on how much money Malone received when he left NSS. Initially, there was a $7,500 difference between the two parties.

The lawyer added that Malone had no basis for suing under federal law. Instead, he said, the case should be tried in state court. He added that Malone made money when he voluntarily sold his stock back to the company.

Last week, both sides presented arguments to a federal judge.

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▶ REGULATORY LANDSCAPE

Leaders mull CEI impact

Conference-goers seek clues to the future.

BY KARYL SCOTT
Washington, D.C. Correspondent

NEW YORK — The term "comparably efficient interconnection" (CEI) may sound like nothing more than some high-tech incantation, but the regulatory proposal has leaders of the largest communications and computer companies struggling to figure out how it will change the way they do business. Many of those industry chiefs were on hand here last week for a two-day Probe Research conference exploring the ramifications of CEI.

The term CEI first appeared on the regulatory landscape in the Federal Communications Commission's May 15 supplemental Third Computer Inquiry notice. CEI requires that dominant carriers like AT&T and the Bell operating companies offer to other service providers the same quality of access to their networks that they enjoy.

The carriers must also unbundle their network services and offer individual service elements to other providers. Those elements must be provided at comparable cost and performance enjoyed by the BOC.

The FCC also gave rise to another concept known as open network architecture (ONA). ONA would create a public network offering common interfaces to all service providers. Dominant carriers would have to make public information on components of the network and methods for making connections to it. The dominant carriers, AT&T and the BOCs, must

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"ABC membership applied for"

▶ INTEGRATED NETS

Lehigh constructs voice/data net

'Student-driven' voice/data network links buildings over fiber-optic cable.

BY MICHAEL FAHEY
Staff Writer

BETHLEHEM, Pa. — A project that began five years ago as a survey of Lehigh University's future data communications needs has evolved into a $20 million integrated voice/data network connecting nearly all of the university's facilities.

In early August, Lehigh cut over an Intecom, Inc. IBX-S80 private branch exchange, which serves as the hub of the network connecting 126 buildings that house some 7,700 pieces of equipment — including four IBM mainframes, thousands of telephones and more than 600 Zenith Data Systems Corp. personal computers.

The university is employing the PBX's least-cost routing capabilities to sell students competitively priced, long-distance telephone service, thereby offsetting a small portion of the system's cost.

Among the applications supported by the system is an automated catalog and circulation system, accessible by telephone, for the university library system. In addition, students and faculty are able to discuss student papers and other projects by using a telephone and calling up the project on their personal computer screens.

In 1981, a faculty committee began exploring Lehigh's future data and video communications needs, according to Eric Ottervik, vice-president for academic services. That committee was soon replaced by a second one.

Both groups were essentially, "research-oriented, faculty-driven committees," primarily exploring host-to-host and computer-graphic resources for the university's academic facilities, Ottervik said.

Two developments changed the focus of Lehigh's examination of its technology needs.

"First, it became obvious that we were approaching saturation on our AT&T Dimension 2000 phone system," Ottervik explained. "Second, people in the student affairs office said they were interested in extending phone service into residence halls — that is, dormitories as well as fraternity and sorority houses." In the past, he explained, students contracted individually with the telephone company for phone service.

"So what began as a fairly narrowly defined look at data and video ended up being virtually driven by our telephony needs," he said. "What looked to be a restricted-in-scope, broadband solution suddenly and naturally moved toward a digital PBX solution, provided a vendor could meet our data requirements.

"We didn't want to do something about phone and data separately, which is what AT&T recommended. We said, 'Let's have this one be student, rather than faculty, driven. Let's talk about putting data, as well as voice, in every student room and in every office, classroom and lab.' "

At that point, Ottervik said the university began considering a digital PBX because the cabling costs of the expanded network would prohibit a broadband local-area net solution.

In the fall of 1984, a third committee was formed, and with the help of an outside consultant, it issued a request for proposal.

The Intecom PBX met the University's technological needs and was offered at an attractive price, he said.

Fiber-optic cable runs from the PBX to 11 network nodes throughout the campus. Campus buildings are tied to the nodes with two-pair twisted copper wire.

The university employs an IBM 4381 mainframe computer to perform many networking tasks, including electronic mail, calendaring and file transfers. When the network was implemented, each faculty member was provided with a Zenith micro.

The university has taken an aggressive approach in setting up a management team to run its communications network.

Ottervik heads up that team, and reporting to him is the assistant vice-president for computing and communications services, Bruce Fritchman, who chaired the initial faculty technology committee. Fritchman, in turn, oversees the telecommunications director, the director of the computing center and the director of administrative systems. ◻

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▶ PROTOCOL CONFORMANCE

OSInet standards tests get started with X.25

BY KARYL SCOTT
Washington, D.C. Correspondent

GAITHERSBURG, Md. — OSInet, the standards-conformance testing network developed under the auspices of the National Bureau of Standards (NBS), is off and running. Vendors and users participating in the NBS-sponsored project are currently testing net equipment for X.25 compatibility and planning other, more ambitious, protocol tests for next year.

OSInet, which officially began operating Sept. 1, is designed to test standards approved by major standards organizations and prototype products that incorporate those standards.

The objective of vendors participating in OSInet is to produce products that can be used together in any network environment. Users are trying to ensure that those products reach the market, while also addressing the multivendor equipment-integration problems faced by most companies.

OSInet was conceived in 1984, before a great deal of attention was focused on testing and certifying protocol standards. Since that time, OSInet has been joined by a growing number of programs fostering the implementation and conformance testing of standards.

One example is the Corporation for Open Systems (COS), which aims to establish a facility where member companies can test products for interoperability before bringing them to market. This differs from OSInet, which is developing the testing methods that COS may adopt.

IBM has also gotten into the conformance-testing action. The company recently announced the establishment of a test center in Rome at which users and vendors will be able to test Open Systems Interconnect (OSI)-compatible equipment for interoperability with IBM protocols, products and services. In July, IBM set up an OSI project office in Palo Alto, Calif. The Rome and Palo Alto offices together will have worldwide responsibility for OSI conformance testing.

Another IBM center, located in La Gaude, France, is intended as a service facility where customers can see interoperability demonstrations.

The confluence of these projects is healthy, said John Haefner, chief of the systems and network architecture division at NBS. "I don't think there will be a lot of overlap," he commented. "The projects are complementary and are open to anyone who wants to participate."

IBM doesn't see a conflict between the multitude of projects either, according to Irv Whitman of IBM's Communications Products Division. Through its standards work in the U.S. and Europe, IBM hopes to facilitate the transfer of standards information between the two continents.

"It would be disasterous if one country went off on its own tangent in the standards arena," Whitman said.

Those participating in OSInet tend to be the same companies that have participated in the NBS OSI Workshop and joined COS. The 25 OSInet participants include IBM, Digital Equipment Corp., Wang Laboratories, Inc., AT&T, Sperry/Burroughs Corp., Honeywell, Inc., Hewlett-Packard Co. and Industrial Networking, Inc. Users include General Motors Corp., Boeing Corp., the U.S. Department of Defense, the U.S. Department of Agriculture and the University of Wisconsin.

OSInet is being used initially to test the X.25 transmission capabilities of each participant. "We want to make sure everyone speaks the same brand of X.25, so each company will test its network node against five other companies," Haefner said.

The basic transmission medium is either AT&T Accunet packet service or Wang's Wangpac service. All NBS laboratories will be connected to NBS' network node. Equipment donated by IBM and software jointly developed by IBM and NBS will provide interested parties with information about the network via electronic mail and bulletin board services. The initial X.25 testing will be completed by the end of this year.

▶ COMMUNICATIONS ALTERNATIVES

User picks satellite service

BY BOB WALLACE
Senior Writer

ALBANY, N.Y. — Keycorp, a financial services company here, is hoping to pare 20% of its annual communications costs by installing a satellite network that will link a trio of operations centers with the company's data processing facilities in Anchorage and Fairbanks, Alaska.

Jay Ward, president of Key Services, Inc., said the satellite network will feature a pair of five-meter dishes at the Alaska sites and three similar dishes to be installed by Skyswitch Communications Co. at Keycorp facilities here and in Augusta, Maine, and Portland, Ore. Key Services is a subsidiary that provides Keycorp users with communications services. Ward forecasted that the network will allow the company to cut annual communications costs by as much as one fifth. "The satellite technology will also enable us to add individual sites to the network in roughly 90 days, regardless of their geographic location," Ward explained.

The Keycorp satellite network, unlike other such systems, will augment, not replace, existing leased lines. Ward said the Keycorp network currently comprises 20,000 miles of leased telephone company lines. This figure will grow and will not be altered by the introduction of satellite equipment, Ward stated.

In the event of a failure in the satellite network, Ward said traffic would be sent over regular dial-up telephone lines to its destination.

In related news, Delta Air Lines, Inc. recently turned to very small aperture terminal technology to restore communications between its terminal in San Juan, Puerto Rico, and its Atlanta DP center.

A fire in the main San Juan central telephone office knocked out

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▶ INDUSTRY INSIGHT

Siemens reorganizes

BY PAM POWERS
Senior Editor

NEW YORK — Siemens Communications Systems, Inc. last week reorganized to incorporate GTE Corp.'s international transmission business and international public switching business product lines. Siemens acquired an 80% interest in the two GTE lines last July and finalized the deal last week.

Under the new structure, Siemens will control three operating companies: Siemens Transmission Systems, based in Tempe, Ariz., Siemens Public Switching Systems, based in Boca Raton, Fla., and Siemens Data Switching Systems, based in Hauppauge, N.Y.

Siemens Transmission Systems is essentially the former GTE Transmission Products Division. GTE microwave and other transmission equipment will continue to be sold in the domestic market under the STS name. A Siemens spokesman said there may be a melding of Siemens equipment with the GTE transmission product line, but as yet none is planned.

The second operating division, Siemens Public Switching Systems, will develop and market Siemens' EWSD digital electronic switching systems to the Bell operating companies and independent telephone

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▶ PC NETWORKS

AST offers Starlan look-alike

BY JIM BROWN
New Products Editor

IRVINE, Calif. — Another entry in the AT&T Starlan-compatible local-area network race was introduced last week by AST Research, Inc. The company unveiled its Star System local net, which reportedly meets the IEEE 802.3 draft specifications for the twisted-pair wired Starlan.

The Star System consists of network interface boards that plug into personal computer expansion slots, network operating software and network hub devices. It can be configured in a 400-foot-long bus topology to support a work group of up to 10 personal computers. The work groups can be tied together through eight- or 16-port Starhubs to form an 8,000-foot-long departmental star topology supporting up to 64 personal computers.

Each personal computer requires either a Starport or Turbostar network interface adapter card plugged into an expansion port. The Starport board simply ties a personal computer into the AST Star System, while the Turbostar features an on-board processor and random-access memory (RAM). The company would not disclose before press time the type of microprocessor or amount of RAM on the Turbostar.

The network operating system includes the AST-Network program and an AST-Network Basic I/O System (Netbios) package. In addition to resource sharing, the AST-Network program supports two modes of electronic mail and user-definable applications menu interface. AST-Netbios links the Star System to IBM Netbios-compatible software such as the IBM Personal Computer local-area network package. The Netbios package supports operation of Netbios-compatible software on the Star System network.

The company also reportedly supplies a Systems Network Architecture gateway that ties a personal computer equipped with a Starport adapter card into an IBM SNA mainframe over a synchronous modem. The firm also provides bridges to tie Star System networks to other networks, including the IBM Token-Ring Network.

The Star System is expected to be available later this month. A starter kit, which includes two AST Starport adapter cards, one 50-foot-long cable, a copy of the AST-Netbios package and two AST-Network operating system packages, is priced at $795. Additional Starport adapter cards are priced at $345 each. A Turbostar board costs $795. The eight-port Starhub is priced at $795, and the 16-port version costs $1,195.

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COMMUNICATIONS SOFTWARE

Microsoft shows Europe a solution

Demos new MS-DOS, Networks versions.

BY MARY PETROSKY
West Coast Correspondent

PARIS — Citing lack of interest among U.S. computer vendors, Microsoft Corp. went to The City of Light recently to demonstrate to European computer vendors the new multitasking version of its industry standard MS-DOS operating system and an enhanced version of its networking software, Microsoft Networks 2.0.

Despite the lack of enthusiasm from U.S. vendors, Microsoft believes the combination of MS-DOS 4.0 and Networks 2.0 offers a number of benefits for local-area network vendors and developers of communications-oriented applications.

England-based Apricot Computer, plc. and SMT/Goupil of France both plan to support the new software, but as yet, no U.S. vendor has opted to back the products, said Dave Melin, product manager for MS-DOS 4.0 and product marketing manager for network operating system software. Microsoft will be releasing both products in the fourth quarter of this year.

Microsoft believes MS-DOS 4.0 will be used mainly in communications applications, particularly in local-area networks, Melin said. By combining MS-DOS 4.0's multitasking features — which include overlapped I/O, a time-sliced scheduler, interprocess communication via pipes and shared memory — with new features of Networks 2.0, Microsoft is able to offer a networking solution that does not require a dedicated server.

"The main thing we were looking for was a nondedicated server, which we didn't have before," Melin said. With the new operating and networking software, a server is now able to handle multiple network requests in parallel. Improved throughput is one by-product of the new software; Melin estimates users on networks with more than 10 nodes will see a 30% improvement in throughput.

Other features of Networks 2.0 include facilities for building a menu-driven interface and an improved print spooler that allows up to 16 printers connected to one server to print simultaneously.

"DOS 4.0 is not going to be a mainstream product," Melin told *Network World* last week, "[because it] does not alleviate the 640K problem," he said. Melin was referring to the fact that MS-DOS does not currently allow users to access more than 640K bytes of a microcomputer's memory. Breaking the 640K barrier is seen by many in the industry as the next major step for DOS. "It's a good solution for server products, but at the workstation, it doesn't buy you that much."

DOS 4.0 is designed for Intel Corp. 8088/8086 or 80286-based personal computers. With the focus in the personal computer market shifting to Intel's 80386 processor, many vendors are waiting for Microsoft to bring out a version of DOS powerful enough to take advantage of the new chip's features.

Another shortcoming of DOS 4.0 is that it requires software developers to write new applications designed specifically to run in the operating system's "background" mode. Under DOS 4.0, an application will run in either the foreground or background. The foreground partition emulates MS-DOS 3.2, allowing applications written for that version of DOS to run unchanged.

The background partition places some restrictions on applications developers; background applications cannot write directly to the computer screen or take over the keyboard, Melin said.

Hewlett-Packard Co. is one of a number of computer vendors currently evaluating the new systems software. "When you add a new operating system to a personal computer environment, you have to take into account all the environments it's going to be used in," said Ormond Rankin, product marketing manager for personal computer networking at HP's Colorado Networks Division.

The value that DOS 4.0 and Networks 2.0 can bring to a networking environment will have to be weighed against development and support implications, Rankin said. The fact that DOS 4.0 cannot address more than 640K bytes of memory "limits the added value, especially in a network environment," said Rankin, who noted that a nondedicated server would have greater utility if it could access more memory. Nondedicated servers are better suited to small networks, Rankin said.

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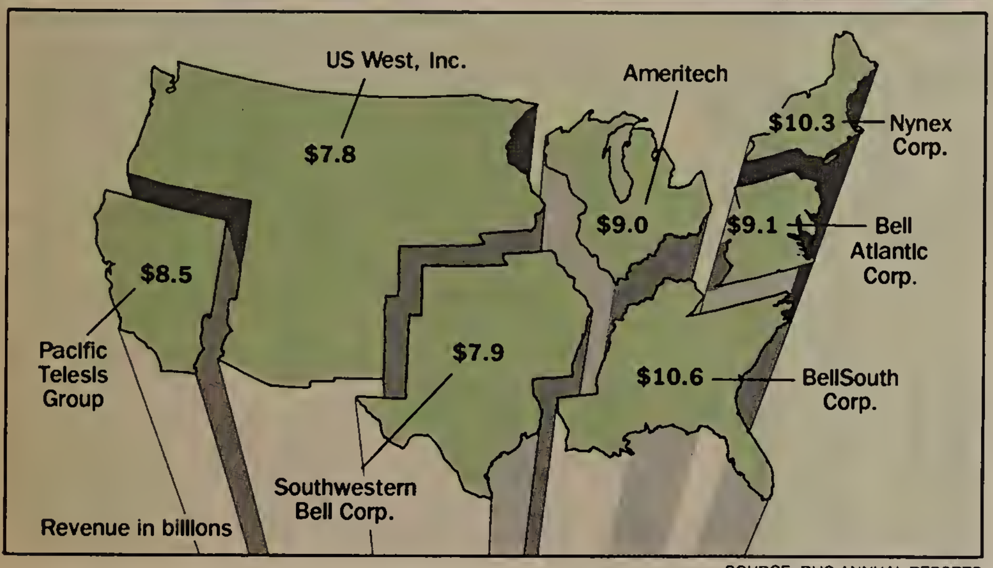
INDUSTRY UPDATE

“Data Communications stock performance has declined over the past year, due to delayed capital expenditures, lengthy customer evaluation periods, increased competition and regulatory upheaval. We do not expect much of a change in this regard over the next six months. However, many companies have refined their product strategy, cut operating expenses and improved their financial position. Most of these companies realize that the single product strategy is inappropriate for the long term and have initiated an OEM, joint marketing merger or acquisition. We believe that much more of this has to occur before the industry is revitalized.

From “Technology Comments”
Alex Brown and Sons, Inc.
Baltimore, Md.

Regional holding company financial statistics for 1985



SOURCE: RHC ANNUAL REPORTS

ANALYSIS

M/A-Com cuts weak links

Company’s dealings spread too thin.

BY PAM POWERS
Senior Editor

BURLINGTON, Mass. — In an effort to narrow its focus in the communications industry and recoup recent losses, M/A-Com, Inc. recently sold two major lines of business and said it will use proceeds of the sales to repurchase as much as 12 million shares of stock. It is rumored that a new chief executive officer will be elected from outside the company.

The company’s cable/home communications line of products was sold to General Instrument Corp.

See **M/A-Com** page 10

LABOR

Snet strike goes on as talks end

Lump-sum wage increase, health insurance prevent agreement.

BY NADINE WANDZILAK
Staff Writer

Talks between the striking Connecticut Union of Telephone Workers (CUTW) and Southern New England Telephone Co. (Snet) broke down Sunday, Sept. 28, as the strike entered its 16th day. No new talks are scheduled.

Snet and the 9,600-member CUTW are both standing firm on two points, according to CUTW spokesman Rick Melita. Snet still insists that $400 of employees’ annual 2½% wage increase be paid in a lump sum rather than added to employees’ base salary. The company also wants employees to shoulder 20% of their annual health insurance premium as well as a higher deductible of $300 for a family, up from $100, he said.

CUTW members disagree. Early last month they defeated a proposed contract that contained those two provisions.

Melita accused the company of posturing during negotiations. “No item on our agenda would cause the company financial hardship,” he said.

In response to the strike, Snet has brought in some 50 to 100 retired company managers, Melita said. The company is focusing on its corporate accounts that need phones installed or repaired and not on residential customers, an approach Melita said might boomerang on the company.

In separate but related action last week, some 250 members of the clerical unit who work on Nynex Corp. telephone directories also continued their strike. These members of the Communications Workers of America (CWA) struck Sept. 20 over a job and salary reclassification proposal.

After negotiations Tuesday, Julie Comperchio, president of CWA Local 1302 in Lynn, Mass., anticipated that a tentative agreement would be reached last week.

CWA members at the Ameritech publishing company in Ohio ratified a contract Tuesday night, leaving Wisconsin Bell as the only Ameritech company where CWA workers have yet to approve a final contract. They are working under a tentative agreement.

INDUSTRY EYE
PAM POWERS

IBM keeps singing those crestfallen cost-cutting blues

While artfully dodging heavy-handed terms such as layoff, IBM is quietly cutting costs in the same mundane ways as its smaller competitors.

Last week, the company consolidated the headquarters staffs of its sales division and Information Systems Group. The North Central and Southwest marketing divisions will merge to form a single national support organization aimed at getting more workers on the road to assist in direct sales efforts. The restructuring will affect some 2,800 employees who may have to relocate, be retrained or both.

This announcement fell close upon the heels of a similar one. On Sept. 8, the Communication Products Division realigned its business units, effecting changes in operations and personnel in Kingston, N.Y., and Research Triangle Park, N.C.

The display and telecommunications subsystems business unit, under Lutz Hahne, is now responsible for development of display products and telecommunications subsystems. The telecommunications systems business unit, under Ellen Hancock, is responsible for telecommunications systems and communications software products. Some product responsibility was shifted from Hancock to Hahne in the reshuffle.

With the realignment, development operations were moved from Kingston to Boca Raton, Fla. Affected employees were offered the choice of relocation or a job change within the corporation.

Then, on Sept. 12, IBM targeted mid- and low-level managers for early retirement and stated it hoped to be some 4,000 employees lighter by year-end 1986.

Equally as sobering was the company’s projected earnings loss for the coming quarter.

R&D still a priority

Yet, in the midst of these cost-cutting measures has come a veritable barrage of product announcements, indicating that no money has been spared for research and development. And despite signs of faltering performance and lots of arrangements that look suspiciously close to layoffs, IBM reportedly is sticking with its no-layoff policy.

What’s next? Industry rumor has it that IBM’s research and development budget will be trimmed.

And the employee shuffle will probably remain popular with management into 1987 as a discreet way to accelerate attrition.

But IBM has walked a long mile to stake its claim in the communications market. In that area, Big Blue will probably exhibit more grit and determination, not less, as it tries to shake off its image as a follower. Recent product announcements belie greater foresight of user needs for network management and multivendor connectivity.

Once, if you were using IBM communications products, you most likely were paying too much for too little in comparison to competitive offerings. That may slowly be changing, despite other companywide cutbacks.

M/A-Com from **page 9**

for $220 million. The line consists of coaxial cable products for the cable television industry, home earth stations for satellite television, set top converters for CATV reception and video cipher encryption equipment for satellite television. The Information Systems unit, which provides data communications services to commercial and government users, was sold to Centel Corp. for an unspecified amount.

Since it began operations in 1950, M/A-Com has grown to $844 million in 1985 sales. The recent lethargy in the computer industry has forced the company into careful reexamination of its marketing strategy, resulting in the whittling away of noncore lines of business.

For the nine months that ended June 1986, M/A-Com sustained a net loss of $47.3 million on revenue of $643 million.

In March, M/A-Com announced a major reorganization. The old structure, which didn't effectively integrate management and marketing of similar product lines, gave way to divisions clearly focused on market area. The current aim, according to a M/A-Com spokesman, is to focus on familiar businesses in which the company has experience and devote resources to areas with the potential for long-term growth.

> *“The recent lethargy in the computer industry has forced the company into careful reexamination of its marketing strategy, resulting in the whittling away of noncore lines of business.”*

In keeping with that strategy, M/A-Com now consists of two major units, the components business unit and the integrated digital communications business unit. The components unit manufactures and markets microwave components. The digital communications unit contains three distinct lines of business. The government systems division makes digital processing equipment for satellite and data communications. The telecommunications division manufactures and markets satellite and data communications equipment for commercial use, and the Microwave Associates Communications (MAC) division makes analog and digital radios and point-to-point microwave equipment for commercial applications.

The shedding of two major divisions is a necessary, if overdue, move. According to the spokesman, each of the four lines of business under the cable/home division was unprofitable and showed no signs of reviving.

Questions remain as to the health of those businesses remaining. Within the telecommunications division, M/A-Com competes in several markets, each with its own dynamics.

In the sale of private packet-switching systems, M/A-Com garnered an 11% domestic market share in 1985, according to International Data Corp., a Framingham, Mass., market research firm. A large contract with Hewlett-Packard Co. for an internal network and resale of packet switches to HP customers should boost sales considerably over the next few years.

But the company suffered a blow with GTE Telenet Communications Corp.'s acquisition of United Telecommunications, Inc.'s Uninet packet network. With that merger, the Uninet network is to be disbanded; users will move to the Telenet network. United Telecommunications has had to back down on a large contract for M/A-Com equipment. As GTE Telenet manufactures its own gear, the contract will most likely never come to fruition.

Despite the setback, M/A-Com has often anticipated future needs in the packet-switching equipment market. It was among the first to develop small switching nodes for the customer premises and sophisticated packet-assembler/disassembler management facilities. Arrangements similar to the one with HP would do much to ensure a solid niche for the company in this market.

M/A-Com also competes in the carrier satellite business, which, the spokesman admits, is cyclical and slow at present. To exacerbate the situation, competition now looms in monolithic proportions with the merging of Communications Satellite Corp. and Contel Information Systems, Inc. But despite

See **M/A-Com** page 14

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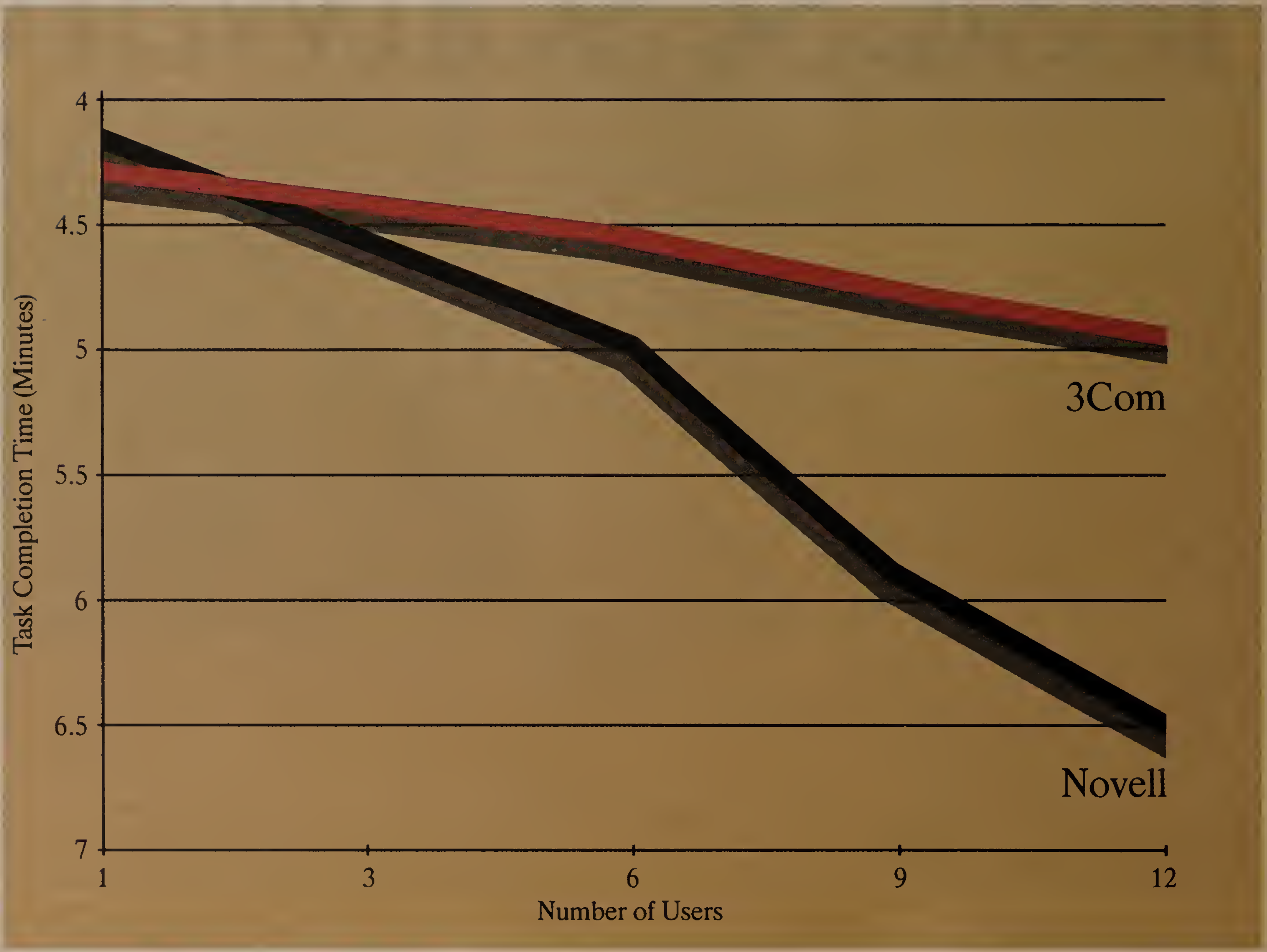

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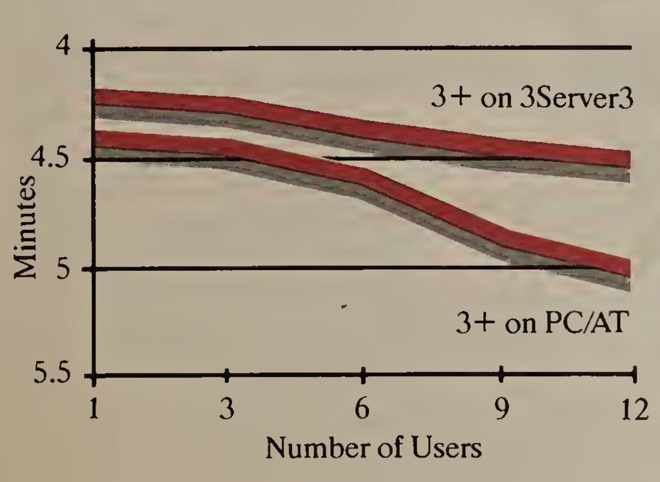

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M/A-Com from **page 10**

sluggish activity on the carrier level, sales of earth stations for business communications are on the upswing, the spokesman said.

In the data private branch exchange market, M/A-Com will have to grapple with competition from local-area network vendors and with other data PBX vendors, such as Equinox Systems, Inc., who have entered the market with inexpensive, modular products likely to attract a good deal of attention.

However, the company has maintained a high profile in each of these markets for many years, and management seems more keenly aware of the weak links in the chain. In particular, the spokesman said M/A-Com sees great potential in the private satellite systems market.

In a related story, rumor on Wall Street says that M/A-Com will elect a new chief executive officer from outside the company. According to a Wall Street source, M/A-Com has met with almost unmitigated disapproval from investors over the past few years. Because the company made several acquisitions that didn't fall within traditional lines of business, and because it failed to integrate the new companies successfully, the overall marketing strategy seemed to lack direction. This proved to be a fatal flaw in terms of stock valuation.

But, the source said, should the company choose to bring in a chief executive officer from outside, the investment community's faith might be renewed. New management may be the final ingredient necessary to cause a turnaround.

In the interim, M/A-Com is taking matters into its own hands with the stock repurchase plan. Companies often repurchase stock when they feel it is undervalued, in hopes of reissuing it later at a higher price. Further, management ownership of stock indicates internal optimism, which in turn encourages potential investors. One investment concern is already eyeing M/A-Com favorably in light of the recent division sales.

With a little luck and a lot of ingenuity, the company will emerge successful, having admitted and righted past mistakes.

CONTRACTS

LOS ANGELES — **AT&T** signed a $21.8 million contract with the **University of Southern California** for a voice and data network.

The network, which will connect over 11,000 users in 185 buildings, will consist of two AT&T System 85 private branch exchanges, 504 Starlan networks, 10 Information Systems Networks and some 12 miles of fiber-optic cable.

The PBXs and local nets will interface with an intracampus microwave network to allow simultaneous transmission of voice and data.

The voice and data network is scheduled for completion in March 1988.

NASHVILLE — **Northern Telecom, Inc.** has signed a $20 million contract with the **Social Security Administration (SSA)** for the sale of its Meridian SL-100 integrated services network.

The system, a private branch exchange used for data transmission, will connect thousands of terminals and personal computers.

It will allow SSA workers to exchange data through the telecommunications system over standard telephone wires as well as provide telephone services to the multibuilding SSA headquarters in Baltimore.

The network is scheduled to begin service in early 1987.

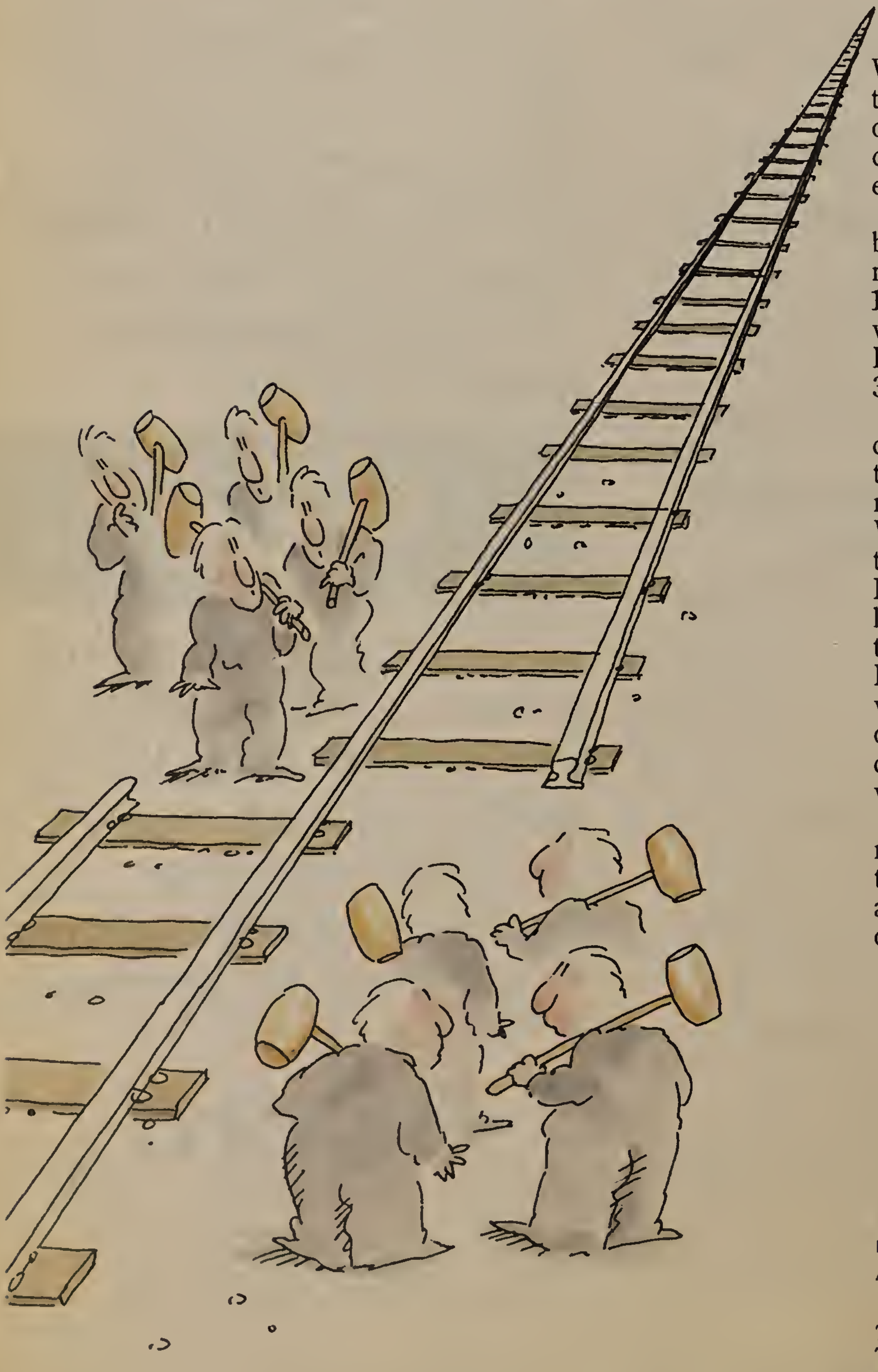
MOUNTAIN VIEW, Calif. — **Bridge Communications, Inc.** was awarded a five-year contract by **SASC Technologies, Inc. (STI)** a Washington, D.C.-based computer system integrator, to supply $7 million worth of broadband local-area network products. STI will incorporate Bridge's line of broadband local-area network units into a complete office automation system, the Air Staff Office Automation System, contracted by the U.S. Air Force.

The system will be used at the Pentagon to establish links to Air Force facilities across the country. Bridge Communications manufactures local-area network system products based on industry-standard technologies, including Ethernet (IEEE 802.3), token-ring (IEEE 802.5) and broadband.

MINNEAPOLIS — The **U.S. Naval Military Personnel Command** agreed to use **Network Systems Corp.'s** Hyperchannel network products under a one-year contract valued at $2.6 million. Additional contracts over the next five years could add another $3 million to the total sale.

The Hyperchannel products will be used to connect more than 2,000 personal computers and terminals to the Navy's mainframe computers.

Network Strategies Corp. designs, manufactures, sells and maintains high-performance data communication networks to interconnect computer mainframes, minicomputers, personal computers, terminals and workstations.



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But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem—from integrated voice/data transmission to electronic mail to credit authorization—and each came away with a unique networking solution.

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TELECOM TRENDS

Allnet to expand net by 4,000 miles

Allnet Communication Services, Inc. has signed long-term agreements with three fiber-optic carriers to expand its network by 4,000 route miles in the Southeastern U.S. The contracts may reach $36 million over a potential 15-year period. Fiber routes will be provided by Microtel, Inc., SouthernNet, Inc. and Southland FiberNet, Inc. All three carriers are members of the National Telecommunications Network, a consortium of seven fiber carriers.

Regional holding company installed base of fiber-optic cable mileage

	1984	1985	1986	1987
Ameritech	NA	51,500	81,000	106,600
Bell Atlantic Corp.	37,537	88,647	162,447	386,400
BellSouth Corp.	NA	123,380	173,380	209,380
Nynex Corp.	57,000	73,700	121,700	171,700
Pacific Telesis Group	NA	84,588	114,788	123,328
Southwestern Bell Corp.	NA	70,000	180,000	300,000
US West, Inc.	NA	45,801	61,201	NA

Figures are in miles NA = Not available SOURCE: GOLDMAN SACHS RESEARCH, NEW YORK

COMPETITION CONFERENCE

Rate deregulation takes industry's center stage

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The winds of deregulation are causing a stir among state telephone regulators and customers. Sixteen states have adopted laws deregulating telephone rates, and 11 others are considering similar actions. The Bell operating companies and their business customers are expected to benefit.

The effect of this movement was the topic of much debate at the state Deregulation and Competition conference held here recently by the State Telephone Regulation Report.

The states in the vanguard of this deregulation movement are Arizona, Illinois, Indiana, Iowa, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oregon, Texas, Utah, Virginia, Washington and Wisconsin, according to Phillip Stoffregen, an attorney and former general counsel for the Iowa Commerce Commission.

Policymakers in these states have adopted deregulation largely upon the urging of local BOCs, Stoffregen said. US West, Inc. has operating company subsidiaries in 10 of those states, a success record that Stoffregen credits to hard and aggresive lobbying.

State legislators deregulate local rates in hopes that the resulting competition will produce beneficial results for consumers. While competition will bring about innovative new services, the secondary effect, in many cases, will be rising telephone rates, especially for residential users, according to some industry observers at last week's conference.

Large-business customers stand to gain the most from deregulation in the form of new services and competitively priced service.

The BOCs argue that deregulation is imperative because local competition has already begun to

See **Deregulation** page 17

SATELLITE SECURITY

HBO signal barrier crashed

Encryption standard falls to pirates.

BY JOHN DIX
Senior Editor

The security of satellite networks was challenged two weeks ago when the owners of a store that sells backyard satellite dish antennas went on national television saying they had found a way to overcome Home Box Office's (HBO) $40,000 signal-scrambling system.

While not as spectacular as the "Captain Midnight" incident last May, when a part-time employee of the Central Florida Teleport in Ocala jammed an HBO broadcast for four minutes, the store's claim raised new concern about the security of satellite networks.

HBO's scrambling system is based on the government-sanctioned Data Encryption Standard (DES), the most widely used encryption method in the communications industry.

Although the security breach may not be as valid as TV audiences have been led to believe, all reported leaks strike interest because the most highly secure transmission systems can be rendered useless if pirates find a way to access the information before it's encrypted.

This latest case revolves around a Sept. 24 demonstration Cabletech of Westbury, N.Y., provided for two TV stations, showing what it claimed was an inexpensive way to pirate scrambled HBO signals. The intent of the demonstration, ac-

See **Security** page 17

CROSS TALK
JOHN DIX

AT&T jumps on the banding wagon

In a rare reversal of roles, AT&T has found itself playing catch-up with competitors.

Two weeks ago, the long-haul giant filed a tariff for a Wats alternative that represents a departure from its traditional Wats pricing methodology.

The new service, the Customer Switched Network Service (CSNS), uses virtual banding, a more flexible alternative already provided by most other long-distance carriers.

CSNS offers volume discounts for users that make 25 to 1,000 hours of calls per month ("Wats alternative bows," *Network World*, Sept. 29). Unlike other Wats services, CSNS access lines can reach anywhere within the country, as opposed to AT&T's traditional Wats lines, which are limited by specific geographical boundaries.

Competitors have been successful in using virtual banding to lure customers away from AT&T.

AT&T Wats rates are calculated using six mileage bands. These bands form concentric rings emanating from the user's location. Band 1 represents the area immediately surrounding the user, and Band 5 covers the territory farthest away. Band 6 rates apply to Hawaii, Alaska, Puerto Rico and the Virgin Islands.

Wats lines have to be dedicated to certain bands. Band 1 Wats lines will typically only serve surrounding states.

Band 5 Wats lines can serve any portion of the country, including states within any of the lower bands.

A company that makes 90% of its calls to Bands 1 and 2 may still need a Band 5 Wats line to serve the remaining 10% of its traffic.

Similarly, a company that has erratic calling patterns may have to use Band 5 Wats lines to cover all potential needs, even though only a portion of its monthly calls actually use those facilities.

In this scenario, the company's switch will first try to route calls over the least expensive Wats line. If the Wats line serving that band is busy, it may end up bouncing the call to a costlier higher band line.

Enter AT&T's competitors with virtual banding.

Virtual banded Wats lines can serve any band at any time. Calls are always charged on an area-served basis, whereas with AT&T's traditional Wats, calls to Band 1 may in fact be charged at Band 5 rates.

Besides this simple cost advantage, virtual banded Wats services simplify facilities management. Communications managers do not have to monitor calling patterns to calculate if the combination of banded Wats lines they have is correct for changing calling patterns.

AT&T says that the new CSNS service represents a move to cost-based pricing. The industry as a whole is moving that way, an AT&T spokesman said.

AT&T will, however, continue to offer Wats on a banded basis. Banded Wats rates provide some customers with an average cost that can be lower than rates available with virtual banding.

▶NETWORKING

Switch's net options multiply

David Systems device wires to coaxial, fiber, T-1.

BY MARY PETROSKY
West Coast Correspondent

SUNNYVALE, Calif. — David Systems, Inc. recently announced networking options for its David Information Manager, an integrated voice/data switch that makes it possible to interconnect the devices in a campus network with fiber optics or in a wide-area net with T-1 digital facilities.

The David Information Manager was designed to provide departmental digital data support within analog Centrex and private branch exchange environments. The system also provides simultaneous transmission of Ethernet, RS-232 and 3270-type data as well as digitized voice over existing twisted-pair telephone wiring.

The system effectively puts four channels onto the twisted-pair wiring: one channel for voice, one for telephone signaling, one for circuit-switched data at rates up to 19.2K bit/sec and a channel for 10M bit/sec Ethernet data.

The new networking options enable users to network David Information Managers in one of three ways. Devices that are located within 100 feet of each other can be linked via coaxial cable. In a campus setting, the Information Managers can be connected using fiber-optic cable at distances up to 1½ miles. And for wide-area networking, the devices can be linked with T-1 1.54M bit/sec digital facilities at distances up to 2,000 miles apart.

Initially, the company will support up to 1,920 RS-232 connections and 960 Ethernet connections per Manager.

The number of nodes supported will jump to 6,000 RS-232 connections and 3,000 Ethernet nodes by June 1987, the company said.

A welcome addition

Networking provisions are a welcome addition to the product, according to Bob Yanover, vice-president, director of communications at Mitsui Manufacturers Bank in Los Angeles.

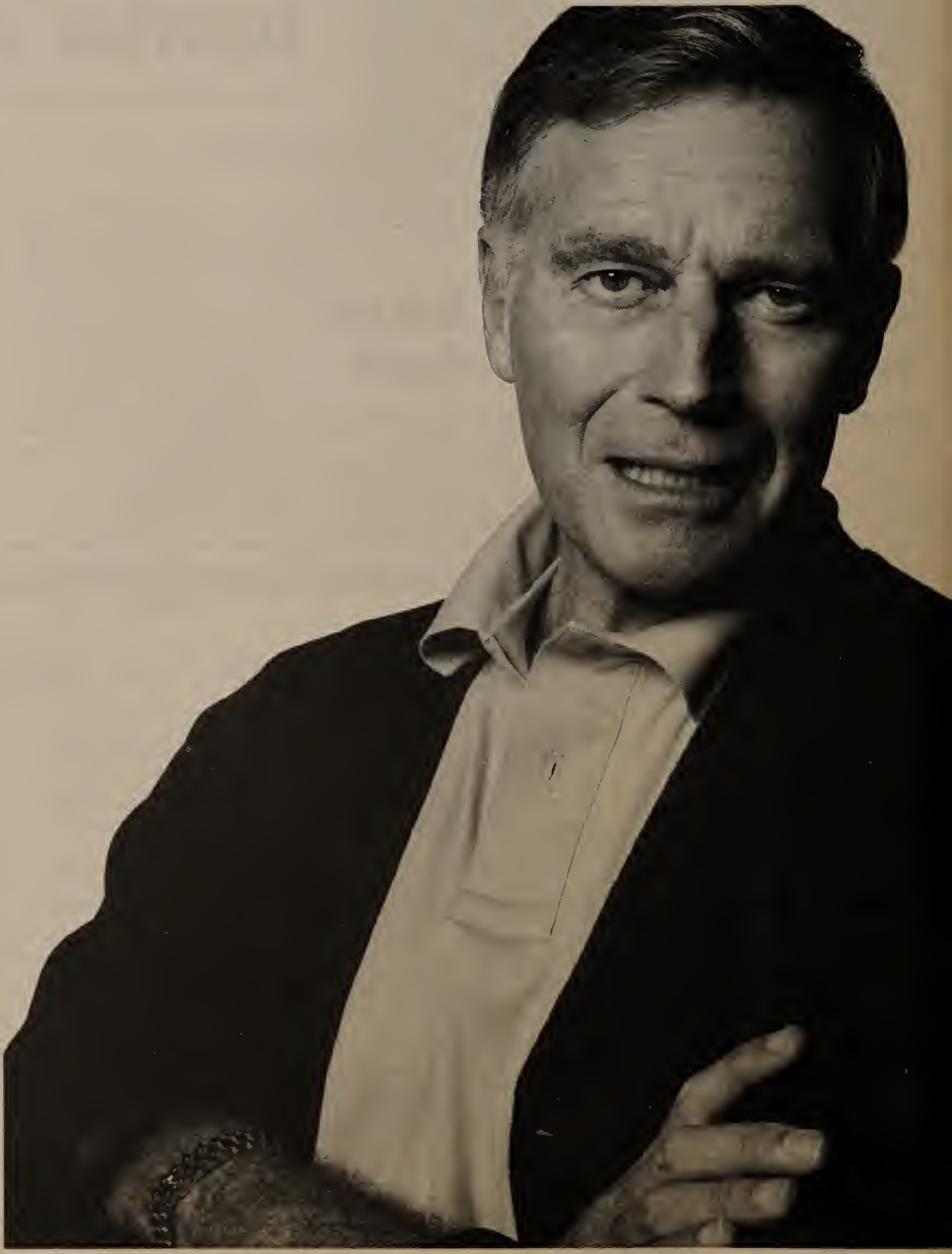
The bank has installed 15 Managers to date and expects to have 19 in place at the bank's 12 California locations by the end of November.

Yanover says he plans to use the Managers to move personal computer data within and between bank offices; however, he has not yet evaluated David Systems' connection methods.

David Systems is offering three topologies for connecting its Managers. Up to five Information Managers can be configured in either a point-to-point or bus topology, while as many as 16 can be linked in a star configuration with one Manager dedicated to act as a Directing Manager.

Information Managers are linked using network interface cards. Manager Link Cards, priced at $4,490 and due for delivery in October, support fiber-optic connections. These cards provide 250 64K bit/sec circuit-switched data channels.

Manager Links over fiber offer an additional 4M bit/sec of bandwidth for Ethernet packet data. The T-1 Link Card, due for release in March 1987, is priced at $6,150. It supports four T-1 spans. Each span has 1.544M bit/sec of bandwidth supporting 24 channels of 64K bit/sec circuit-switched data.



Security from **page 15**

cording to Larry Altman, part-owner of the store, was to send a message to HBO protesting the monthly service fees HBO is now charging owners of private satellite dishes.

Altman, like Captain Midnight and other dish retailers, is irked by HBO's decision to scramble the programming it distributes to cable television operators by satellite. Before HBO began scrambling its signals, people with dish antennas could pick programming out of the sky for free.

Now dish owners have to lease or buy signal descramblers and, what is worse in the eyes of dish retailers, pay a monthly service fee just like cable-supported customers. The added costs are hindering antenna sales.

According to Barry Altman, co-owner of Cabletech and Larry's brother, the store was able to unscramble HBO's video signal using $3 worth of parts. They also contend that they intercepted and decrypted the accompanying audio channel, a process that involved even less expensive parts but more work and the use of a home stereo amplifier.

In a prepared statement, Cabletech said it would agree to show the manufacturer of the scrambling equipment how and what it used to best HBO's security system if the vendor agrees to recall the devices and refund the purchase price to consumers and wholesalers.

HBO and the equipment vendor, the VideoCipher division of General Instrument Corp., brush Cabletech's claim off as a farce. "You haven't done it, and don't let us catch you saying you have, or we may hit you with a slander suit," was Doug Lindquist's message to Cabletech. Lindquist is assistant vice-president of marketing for VideoCipher.

HBO and VideoCipher contend that Cabletech did, in fact, descramble a video signal; however, they say it merely amplified a CATV-delivered nonscrambled audio channel. HBO's VideoCipher II equipment merely fogs transmitted images, but it digitizes the audio and scrambles the signal using DES. Image encryption with VideoCipher II, both companies admit, is relatively easy to overcome, but the audio encryption is another story.

"We use the DES algorithm to encrypt the audio signal bit by bit," Lindquist said. Use of a 56-bit DES word means that something "in excess of 76 quadrillion combinations would have to be tried by trial and error to find the key we were using to scramble a particular program," he said.◪

Deregulation from **page 15**

erode some of their traditional businesses and monopoly strength. "If competition truly exists, regulation is not necessary. If the marketplace demands reasonably priced products and good quality service, the government no longer has to be involved," said David Mack, director of public affairs at Northwestern Bell.

Arguing that competitors "are chipping away at our most profitable markets," Mack said, "we're being priced out of the business communications and large-volume markets because regulation requires us to subsidize local service with revenue from our competing services. That means we have to price services higher than we would like."

Deregulation has come to the states not only through legislative initiative but also through federal preemption, said Perry Swisher, president of the Idaho Public Utilities Commission (PUC). The effect of federal preemption has not always been in the customer's best interest, he noted. Citing a federal order to make competitive "time of day" service offered by the BOCs, the PUC found that it cost more for the BOCs to account for those calls and bill customers than it would have been to continue offering the service free.◪

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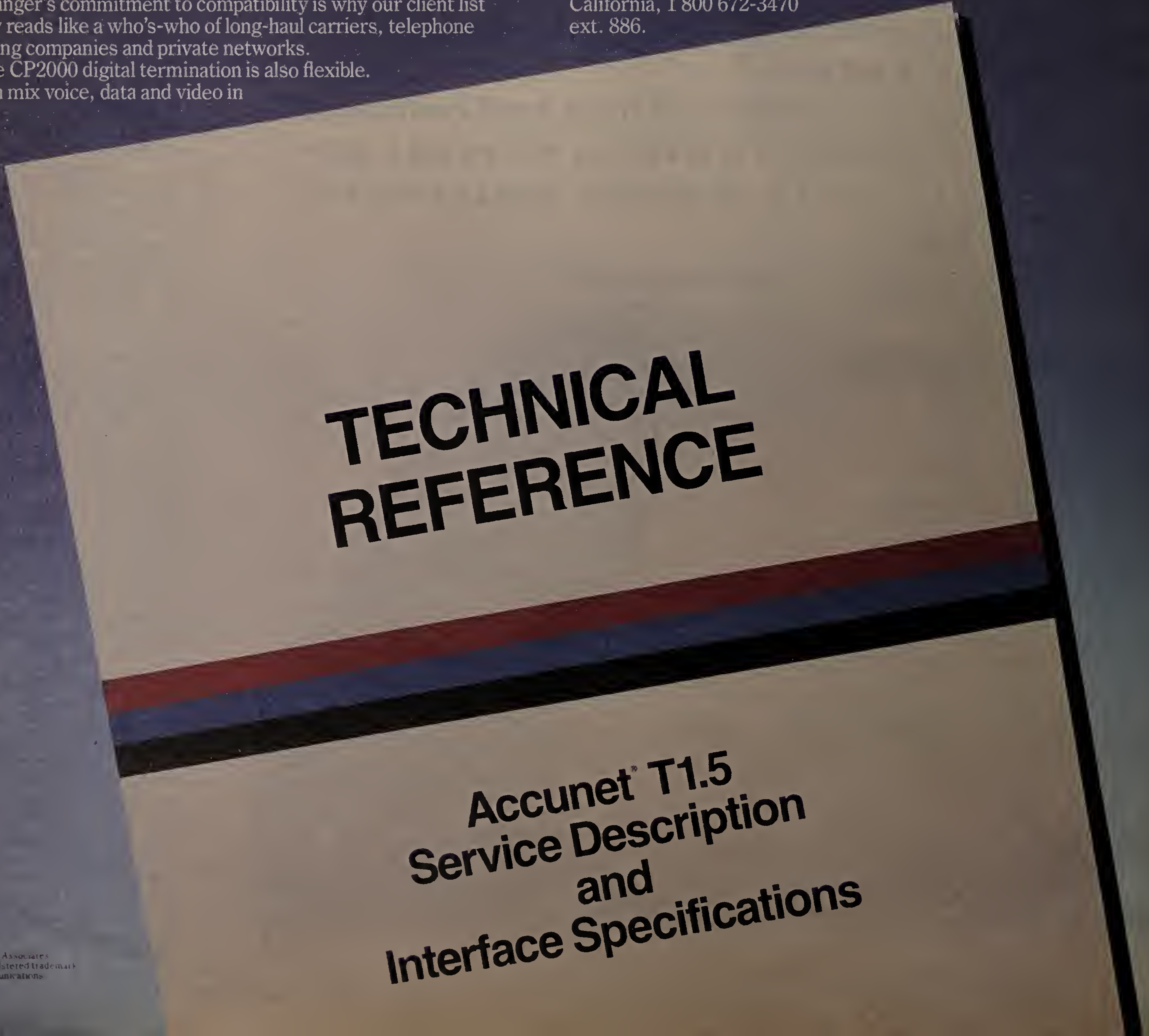

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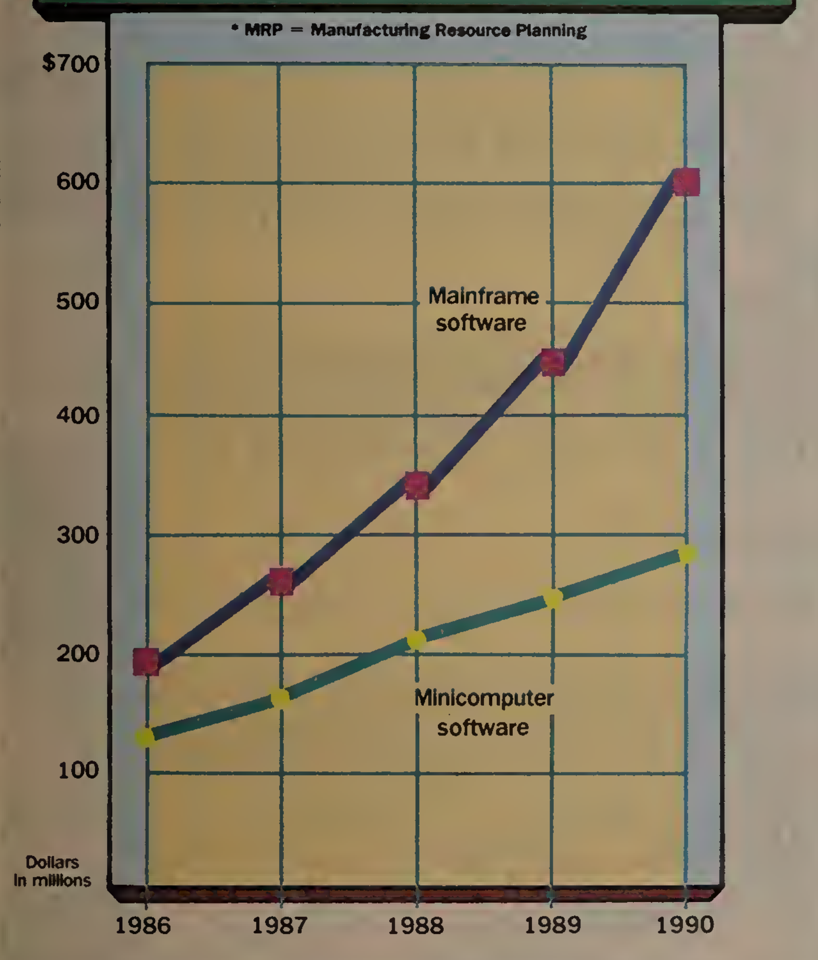
FACTORY COMMUNICATIONS

> “We are trying to raise the level of understanding of some of the problems related to Computer-Integrated Manufacturing by showing [users] what has worked for other manufacturers.
>
> **Donald Manor**
> President
> Computer and Automated Systems Association

Projected market for MRP-II* software systems in large U.S. manufacturers 1986-90

* MRP = Manufacturing Resource Planning



SOURCE: FROST & SULLIVAN, INC., NEW YORK

▶ AUTOFACT '86

Casa chief urges CIM exploration

Award recipients to speak about systems.

BY BOB WALLACE
Senior Writer

DETROIT — The president of the Computer and Automated Systems Association (Casa) urged managers attending the Autofact '86 conference here next month to explore systems integration issues with users that have already met the Computer-Integrated Manufacturing (CIM) challenge.

Autofact, at which some 260 factory equipment vendors will peddle their wares, will be held at Cobo Hall, Nov. 11-14.

Casa, part of the Society of Manufacturing Engineers, forecasts a total show attendance of approximately 25,000. Casa sponsors the annual automation conference and exposition.

Casa President Donald Manor, who also serves as Deere & Co.'s division manager of design systems, said users should track down previous winners of Casa's Industry Lead Award. The award is presented to a user company that exhibits leadership and excellence in the application and development of CIM systems.

Casa has set up an Autofact session during which the five previous award recipients will speak about their efforts to integrate manufacturing systems. Casa, which boasts 11,000 members in 30 nations, is an educational and scientific association that is working to promote the use of computers and automation in the field of manufacturing.

Past Lead award recipients include Deere, Ingersoll Milling Machine Co., AT&T Technologies, General Electric Co. and Cone Drive Operations of Ex-Cell-O Corp. The 1986 award will be presented to Martin Marietta Energy Systems.

In addition to the award presentation, users at the Autofact show will be exposed to a blend of technical sessions, tutorials

See **Autofact** page 22

INCIDENTALS

Sperry Corp. announced it will demonstrate a broadband network, reportedly compatible with General Motors Corp.'s Manufacturing Automation Protocol, at the Autofact '86 conference next month in Detroit.

The company would not say which vendor's local-area network would be used to connect Sperry devices. The demonstration is expected to showcase hardware and software products produced by several vendors.

✹

Integrated Computer Systems of Culver City, Calif., has announced a two-day course to be offered next month.

“MAP/TOP: Networking in Industrial Environments,” is designed to provide attendees with an introduction to Manufacturing Automation Protocol/Technical and Office Protocol, data communications and computer networking technology.

The course will also instruct users how to evaluate, select and configure a pilot MAP/TOP network for specific applications.

For additional information, contact Integrated Computer Systems at (800) 421-8166.

FACTORY FACTS

BOB WALLACE

User: Vendor promises are worthless; MAP Users Group needs a face-lift

The Manufacturing Automation Protocol Users Group needs to be improved.

There is far too much focus on the future and far too little explanation of what users are doing now.

As hard as General Motors Corp. and company are trying, the users group's meetings are becoming vendor-dominated, and users aren't happy about that. One user said he was sick and tired of hearing about commitments from numerous vendors to build products compatible with the factory communications specification.

“Vendor statements of commitment are worthless,” the user claimed.

“I looked at the MAP/TOP Product Directory. Two thirds of the vendors listed had no promised product shipping date,” the user complained.

“If these vendors can't ship or give an availability date for their product, they shouldn't be listed.”

The user also suggested companies installing MAP networks open their doors to members of the users group so that all may benefit. It is difficult to learn from the experiences of others when others won't tell you what their experiences were.

“At the MAP Users Group meetings, users explain what they are doing in a broad sense, but they don't tell you what equipment they hooked together, how they hooked the equipment together and what capabilities they realized from connecting this equipment,” the user pointed out.

“In most cases,” he said, “I attend the Users Group meeting to locate users who are actually working on MAP projects. I'm not interested in papers that deal with theory.”

The user said he was worried the MAP Users Group meeting risked being overrun by vendors. “If users attend shows where everyone is trying to sell products and the users don't get any new ideas from other users, they will become disinterested in attending the meetings in the future.”

The user said too many of the presentations given at the MAP Users Group meeting are too general and should be made to focus on specific aspects of factory networking. “I've been to many presentations that are far too basic in nature. I don't need to be told repeatedly what the seven layers of the MAP specification are.”

The user said there was a critical need for visual materials such as slides and printed materials to be incorporated into the meetings' factory networking presentations.

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3. If you need to share information with other users within your office, we offer local area networks to support office applications.

4. And for users who need voice and data communications, plus access to data bases both inside and outside of the company, we offer a digital switch, the ROLM CBX II.

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MAP/TOP MEETINGS

The following is a partial list of Manufacturing Automation Protocol, Technical and Office Protocol and related meetings. This data has been supplied by the Industrial Technology Institute of Ann Arbor, Mich.

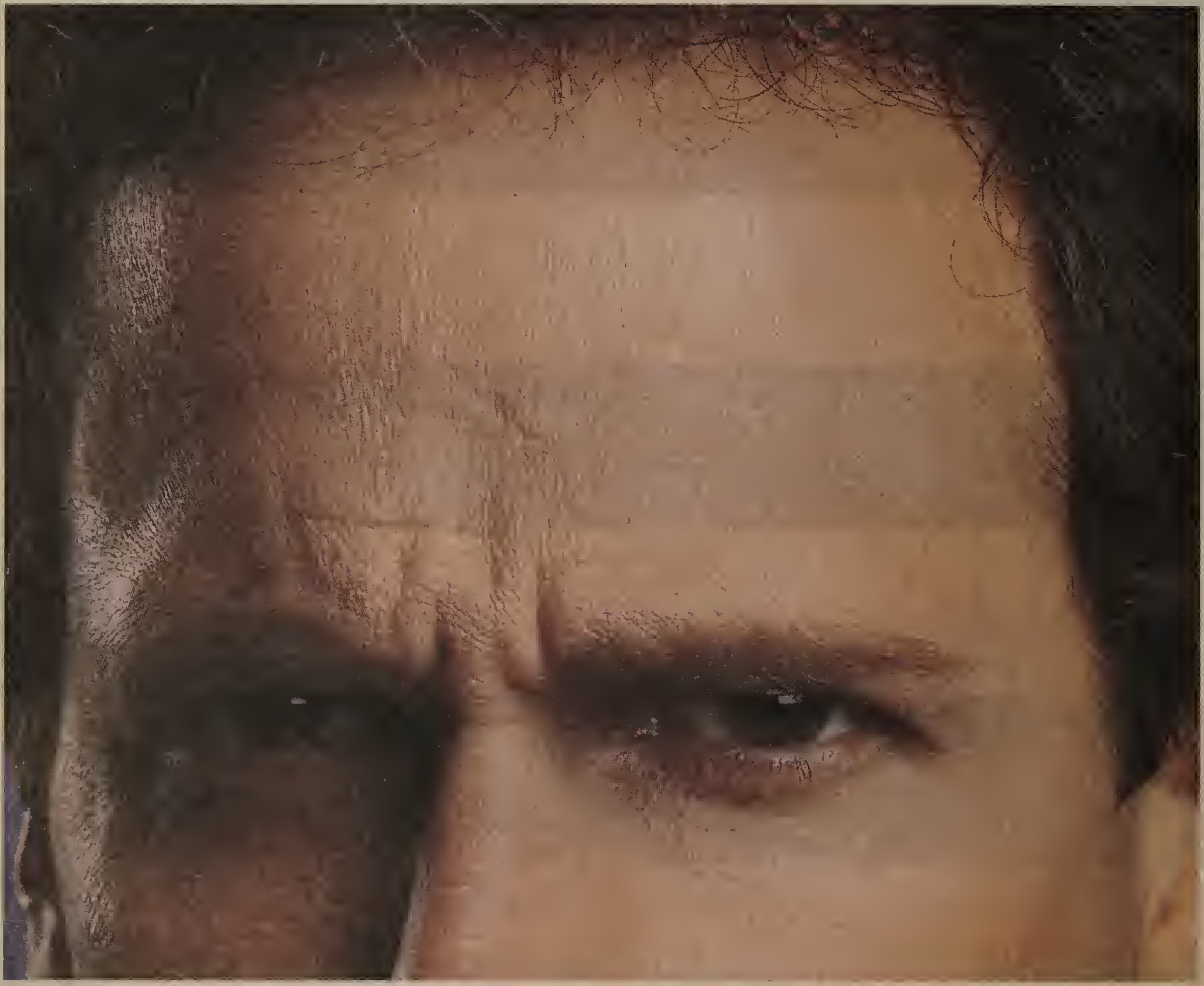
Oct. 13, Ansi X3T1D1
Speaker: Steve Levin
committee chair
Location: Raleigh, N.C.
Sponsor: Ansi
Contact: Steve Levin
(609) 683-1150

Oct.14, MAP Technical Review Committee
Speaker: Tom Brushaber
committee chair
Location: General Motors Corp.'s Tech Center
Sponsor: MAP Task Force
Contact: Tom Brushaber
(313) 456-2234

Oct.16, MAP Task Force
Speaker: Steve Dillion, committee chair
Location: GM Tech Center
Sponsor: MAP Task Force
Contact: Steve Dillion
(313) 575-2843

Nov. 3-7, Ansi X3S3.3
Speaker: Lyman Chapin, committee chair
Location: Washington, D.C.
Sponsor: Ansi
Contact: Lyman Chapin
(617) 366-8911

Nov. 3-7, Ansi X3S3.7
Speaker: Catherine Dally
committee chair
Location: Washington, D.C.
Sponsor: Ansi
Contact: Catherine Dally
(703) 281-1135



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HEWLETT PACKARD

MC15504

Autofact from **page 19**

and forums focusing on the technical and management issues that must be confronted in the successful implementation of CIM systems.

Unlike Autofact '86, which focused largely on Manufacturing Automation Protocol/Technical and Office Protocol efforts, this year's event will highlight techniques for educating and selling corporate management on the CIM concept.

Justifying CIM

Manor claimed a large portion of the Autofact '86 seminar series will focus on the justification of CIM.

"Justifying CIM is a long-term project as opposed to simply purchasing a machine tool for a specific application," he said. The responsibility for procuring and integrating manufacturing systems is generally given to the manager of a specific facility, Manor explained. "This is especially true with large, decentralized companies like Deere and General Motors Corp.

"The largest problem we have encountered at Deere is standards," Manor said. "The first part of this problem is developing an awareness that a common set of standards — that doesn't hold back the development of advanced factory technologies — is needed.

"The second part of the problem is getting equipment vendors to incorporate these standards in their products. That is why Deere is deeply involved in the MAP/TOP effort."

Manor said cost reductions in the production of the farm equipment Deere manufactures are the primary incentive behind the company's concentrated efforts to integrate manufacturing systems in its 20 factories.

"We are under tremendous pressure to reduce costs because the majority of our income is from members of the farm industry — and there is no question what shape they're in," Manor explained. "We are not going to have a lot of farmers who are losing money buying equipment from us at the same time," he predicted.

The plight of the nation's farmers has directly influenced the manner in which Deere manufactures its products. "We are constantly physically reconstructing our manufacturing plants," Manor said. According to Manor, at least four Deere plants have been outfitted with factorywide, coaxial cable-based, broadband local-area networks. Other facilities use fiber-optic cable to handle network traffic.

Manor said Deere is moving toward a cellular manufacturing scheme in which an entire production function is performed within a separate work area, or cell. All manufacturing cells would be linked to the plantwide factory network.

Deere has also initiated a program designed to eliminate waste in the manufacturing process. Manor said the project incorporates Just-In-Time's zero inventory concept. ☐

DATA DELIVERY

AT&T: a strategic analysis

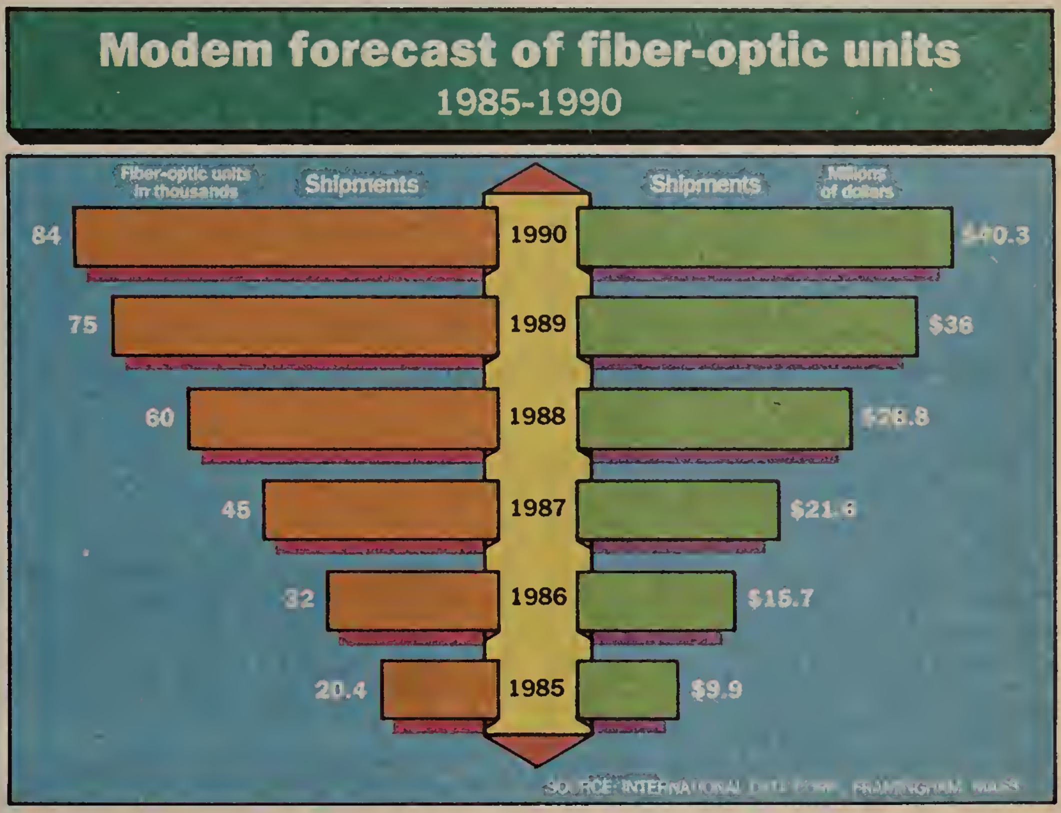
Gartner Group, Inc., a Stamford, Conn., market research firm, recently published "A Strategic Analysis of AT&T." The 150-page report describes the company's organization, computer systems, communications products, services and presence in international markets. The report costs $995. For more information, call Robin Naismith at (203) 967-6855.

FIBER-OPTICS

Fiber modems gaining ground

Security and support of high-speed transmission spur increased sales.

BY PAUL KORZENIOWSKI
Senior Editor



Modem forecast of fiber-optic units
1985-1990

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

The term fiber-optic modem is something of a misnomer.

Modems use modulation techniques to transform electronic pulses into carrier signals, so digital information can be sent over analog lines. Fiber-optic modems transform electronic impulses into light waves, which move information over fiber-optic lines. Because fiber-optic modems do not employ traditional modulation techniques, you could say the devices are not really modems at all.

The confusion in terminology, however, does not seem to be deterring fiber-optic modem buyers. International Data Corp. (IDC), a Framingham, Mass., market research firm, reports that fiber-optic modem sales increased by a healthy 81.8% last year.

The growth is due in part to the emerging market's relatively small size. IDC estimated that approximately 11,000 fiber-optic modems were purchased last year. In comparison, more than one million long-haul analog modems were sold, according to IDC.

Besides the different technologies they employ, there are other differences between fiber-optic and analog modems. None of the traditional modem manufacturers plays even a minor role in the fiber-optic modem market. Instead, companies like Canoga Perkins, Versitron, Lightwave Communications, Inc. and S.I. Tec, Inc. lead the fiber-optic modem race.

Analysts say a principal selling point of fiber-optic modems is their ability to support high-speed transmissions. Some modems support transmissions up to T-1 speeds of

See **Modems** page 25

DATA DIALOGUE
PAUL KORZENIOWSKI

Netview enhancements separate winners from losers

As the dust settles from IBM's recent enhancements to Netview, winners and losers are becoming more visible.

IBM appears to be the biggest winner. By extending Netview's grasp from IBM proprietary Systems Network Architecture networks to non-SNA and non-IBM equipment, IBM has again demonstrated that it will make any move necessary to protect its position as the most important player in the industry.

> *"IBM has again demonstrated that it will make any move necessary to protect its position as the most important player."*

A number of analysts predicted the vendor that controls the network ultimately will rule the industry. As voice and data functions merge, network management will become the critical issue for most corporations. The enhancements to Netview enable IBM to lay first stake to this most important territory. This approach differs dramatically from IBM's typical late entry into emerging markets.

The announcement is important because IBM melded traditional voice management functions into its data network management offering. How to integrate voice and data functions properly is one of the most important decisions that large and small corporations currently face. IBM has supplied its customers, the MIS managers, with a mechanism for tying the two functions together. This type of mechanism has yet to be provided by traditional voice vendors. If AT&T expects really to compete with IBM, the communica-

See **Netview** page 26

MARKET TRENDS

Separate fates for T-1, stat muxes

Report cites glory and demise.

BY NADINE WANDZILAK
Staff Writer

FRAMINGHAM, Mass. — The future of T-1 multiplexer vendors looks bright, but dark clouds loom ahead for statistical multiplexer vendors.

Those were a few of the findings in a report on multiplexer market trends produced by International Data Corp. (IDC), a market research firm based here. The 56-page report covers worldwide multiplexer market shipments for manufacturers based in the U.S.

As users search for cost-effective ways to accommodate a variety of transmission media, they are finding that voice-grade and digital data service transmission facilities do not accommodate their transmission needs. Consequentially, the report found that they are turning to T-1 lines to solve their communications problems.

The result is that T-1 multiplexer shipments increased by 90% in 1985, up from 2,765 units in 1984, according to the report. IDC estimates that shipments will continue to grow during the next five years, and 17,000 devices will be shipped in 1990.

But IDC predicts that point-to-point and point-to-multipoint T-1 multiplexers will have only limited appeal by 1990 as more intelligent switches replace them. Examples of this type of device are the Integrated Digital Network Exchange from Network Equipment Technologies Co. and the N16 switch from Network Switching Systems, Inc.

While T-1 shipments are increasing, growth rates for statistical division multiplexers are slowing, according to the report. The low-end stat segment, the largest in terms

See **Study** page 24

▶ DECNET UPDATE

DEC introduces terminal server/mux package

BY NADINE WANDZILAK
Staff Writer

MAYNARD, Mass. — Continuing efforts to maintain momentum behind the sale of its Decnet products, Digital Equipment Corp. last week introduced a two-part terminal server and multiplexer package that the company says supports data transmission speeds up to 19.2K bit/sec between an Ethernet local-area network and remote data terminal equipment.

On the local-area network side, a Muxserver 100 combines the functions of a terminal server and a local statistical multiplexer. The product acts as a network switch to one or more host computers on the network and connects up to 16 remote devices to the local network. A DEC transceiver and transceiver cable connect the Muxserver to the network.

One Muxserver can support two remote Decmux IIs. Each Decmux II can support up to eight asynchronous terminals, serial printers or personal computers in terminal emulation or file transfer mode. The system supports up to six simultaneous sessions per remote terminal.

Connecting the Muxserver 100 and Decmux II are a pair of external synchronous modems and a dedicated 3002 leased phone line or equivalent transmission service.

In some cases, two remote multiplexers can use the same transmission line and single pair of modems. In this scenario, Decmux data concentrator capabilities compress the data from the two boxes onto one line.

The package offers character compression, automatic error detection, load balancing among host computers, automatic host reconnect after interruption, diagnostics and centralized network management. The server is password-protected. The system uses DEC's Local Area Transport protocol.

The first units are scheduled to ship in December, with volume shipments in January. Hardware for a 16-channel configuration — one Muxserver 100 and two Decmux II units — is priced at $10,000.

The software license fee is $150 per Muxserver. The software must be loaded on at least one Phase IV Decnet host on the local net. The software is downloaded when the Muxserver is powered up or reinitialized. The Decmux II does not require a software license. ◪

Study from **page 23**

of units, grew 7% from 58,680 units last year. The midrange went up only 4% from 20,859 units, and the high-end segment expanded a measly 1% from 2,320 units. IDC says it expects this slow growth to continue throughout the next five years.

The report attributes last year's sluggish growth to three factors: a decline in capital spending, the emergence of alternative technologies, such as local-area networks and packet switching, and a strong U.S. dollar.

As a result of market conditions, data communications equipment vendors will be forced to market more advanced and competitively priced products, according to IDC. For example, networking statistical multiplexers will be offered, allowing point-to-point multiplexer applications to become complex multinodal systems, without making existing equipment obsolete.

Statistical multiplexers are currently being integrated with high-speed microprocessor chips to allow for high-speed 56K bit/sec synchronous data transmission.

The study charts the multiplexer marketplace by product, vendor and product category. It also explains vendors' distribution strategies. The report includes a number of other findings. The number of new fiber-optic multiplexers grew by 41% last year, up from 3,330 units in 1984. That market will reach 10,650 units by 1990, IDC predicted.

Although fiber-optic cable is an attractive transmission medium, fiber-optic multiplexers are considered more a replacement than a revolutionary technology, according to IDC.

The large base of copper telephone wire represents an enormous cost. Therefore, IDG expects the evolution to fiber optics to occur gradually.

The medium-speed time-division multiplexer segment grew by 11% last year, over the prior year's 3,157 new units. This market will grow moderately in the next five years to reach 6,123 units in 1990, the report said.

The study, entitled "Multiplexer Market and Technology Trends," is priced at $1,500 per copy.

IDC is located at 5 Speen St., Framingham, Mass. 01701. ◪

BEFORE WE TRY T
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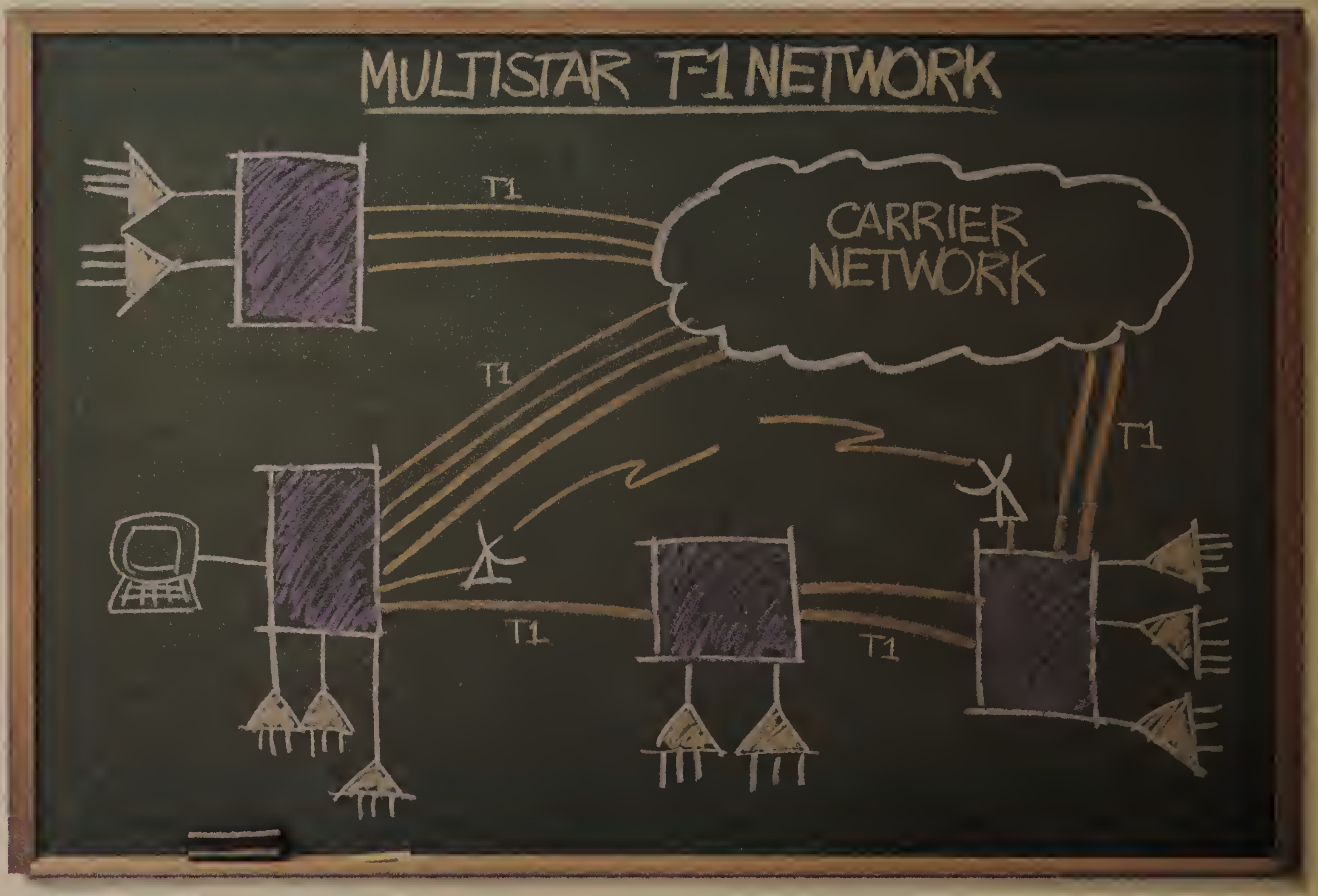

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The point is, we've years of experience and expertise built into all our hardware.

Modems from **page 23**

1.5M bit/sec.

The types of applications that use fiber-optic modems appear to differ from those of traditional modems, which typically connect a user at a remote site to a central host system. Fiber-optic modems can support this type of transmission and have the bandwidth needed to connect a remote computer-aided design and manufacturing user to a host. But using a fiber modem to tie a remote user to a central processor is the exception rather than the rule.

Often, fiber-optic modems replace microwave links and tie together a number of closely situated buildings, according to Robert Reinhold, staff consultant at Network Strategies, Inc., a Fairfax, Va., consulting firm.

For example, Lockheed Corp. has been using fiber-optic modems to link five of its buildings in Houston. Lockheed users work with Digital Equipment Corp. Ethernet local-area networks that support office automation applications. The modems act as gateways between various buildings and enable users to share information, according to Paul Hemphill, systems analyst at Lockheed.

John Hancock Mutual Life Insurance Co. uses fiber-optic modems at one of its buildings located in a four-building Boston complex. A year ago, the building was wired with twisted-pair cable. On each floor, data is concentrated and sent to a fiber-optic modem that ties into a fiber backbone network, which runs up the building's various floors. The company plans to link all four of its buildings with fiber, and fiber-optic modems could supply that link.

Lockheed and John Hancock are rare examples of commercial fiber-optic modem users. The devices seem to be having a much easier time finding homes in the government sector. A spokesman for Canoga Perkins said government agencies account for the bulk of the company's fiber-optic modem sales.

One reason the government is attracted to fiber-optic modems is security. A number of government agencies use a network overseen by the Department of Defense. The Defense Department has laid down strict requirements for data transmission, and agencies have to ensure that intruders cannot tap into information on the network.

Fiber-optic lines are a more secure medium than copper wire or coaxial cable. Intruders find it nearly impossible to tap into a fiber line. Consequently, fiber connections can be used in place of other lines equipped with encryption devices and supply the agencies with a cost-effective, secure connection.

Government users may more easily cost-justify a fiber-optic modem purchase than business users. Prices for fiber-optic modems range from $500 to $1,000. Commercial users may be hard pressed to justify purchases when less expensive modems are available.

Businesses may find fiber-optic modems somewhat limited. The devices are designed only for point-to-point connections.

Businesses want to pack their fiber lines with as much information as possible. In many cases, they opt for fiber-optic multiplexers rather than fiber-optic modems. The market for fiber-optic multiplexers is growing even more rapidly than that for fiber-optic modems, according to J. Morris Weinberg, chairman of the board at Fibronics International, Inc., a Hyannis, Mass., vendor that makes both types of products.

Another shortcoming stems from the relative newness of fiber-optic modems, which were introduced in the late 1970s. This new market has a small number of participants, and few companies have completely fleshed out their product lines.

Consequently, users may be unable to find fiber modems with the interfaces and capabilities they need. Two years ago, when Lockheed was looking for a fiber-optic modem, only two vendors sold products with V.35 interfaces, according to Hemphill.

Fiber tends to be distance-sensitive. A number of products are unable to supply a clear signal for more than a few miles, according to Network Strategies' Reinhold. As a light wave travels along the fiber, it disperses. The longer a pulse travels, the more likely it is the dispersion will create some type of transmission problem.

Fiber modems also lack network management facilities, according to Lynn Davis, an IDC analyst. Error rates for fiber-optic transmission are much lower than those for analog transmission. So the need for network management facilities is not as great with fiber-optic lines as it is with analog lines.

More importantly, network management is usually the last piece of an emerging transmission technology puzzle. Fibronics' Weinberg said that a number of fiber modem vendors have recently announced first-generation network management packages. The number of these packages is expected to increase dramatically during the next few years.

The emergence of these packages may help to ensure that the growth rates for fiber-optic modem sales remain healthy during that time. ◼

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Netview from **page 23**

ers with similiar capabilities — pronto.

The seven companies that worked with IBM to develop Netview/PC also will emerge as winners. In competitive markets, Network Equipment Technologies Co. (NET), Timeplex, Inc., Datatel, Inc., DMW Group, Inc., Teleprocessing Products, Inc., Doelz Network, Inc. and Industrial Networking, Inc. have gained a leg up on competitors, who will be scrambling to develop Netview interfaces.

Losers will include companies that have merely mouthed support for integrated network management facilities. Few of these companies have attempted to supply users with the necessary tools. The International Standards Organization's Open System Interconnect (OSI) model has yet to address network management issues. When OSI network management products become available, hundreds of vendors will have already delivered products that tie their network management offerings to Netview.

Mainframe vendors such as Burroughs Corp., Honeywell, Inc. and NCR Corp. will have trouble matching Netview's network management capabilities. Minicomputer companies, like Digital Equipment Corp. and Wang Laboratories, Inc., do not have the tools needed to compete with Netview.

> *“ Losers will include companies that have merely mouthed support for integrated network management facilities. Few of these companies have supplied users with tools. ”*

Avant-Garde Computing, Inc. is the company most aggressively pursuing the same niche as IBM, and Avant-Garde's Net/Command is the only true competitor to Netview. Net/Command can work with Avant-Garde, IBM, Codex Corp., Bytex Corp., T-Bar, Inc., Timeplex, Inc., LP Com and NET network management offerings.

Interfaces to these products were developed by Avant-Garde. IBM has thrust the role of developing Netview interfaces onto various manufacturers. Avant-Garde will have to decide if it wants to continue to develop the interfaces itself, which will be a costly process.

Other companies, such as Infinet, Inc., were developing a complete network product line and positioning their network management package as the line's cornerstone. These companies may be unable to supply the breadth of products needed by IBM customers. Companies like Infinet may decide not to compete with IBM on a direct basis. Instead, they may target network problems faced by smaller companies that use minicomputers as central processors.

The companies that decide to slug it out toe-to-toe with IBM will point to Netview's shortcomings. First, the product is expensive. Netview runs only on IBM mainframes, which have never been cheap. Other network management packages run on less expensive minicomputers or microcomputers.

Also, tying various network components into Netview is a costly proposition. Netview/PC runs on an IBM Personal Computer. To fully integrate all network management components, a number of these computers with the Netview software, selling at $2,000 a pop, will be needed.

Once the network is tied together through Netview, performance issues may arise. No one is sure to what degree the extra network management functions will affect Systems Network Architecture performance.

Another shortcoming is that Netview represents only a first step to integrated network management. Network managers will be able to monitor alarm conditions, but they will not be able to perform diagnostic tests or reconfigure various connections. This capability should be included in future releases of Netview, which will not be available for at least a few years.

Users have to wait even for the first step toward integrated network management. Netview/PC will not be available until sometime next year.

During that time, competitors will have to determine what part of the network management they are interested in and how to position their products. No vendor wants to align itself too closely with IBM. However, the Netview announcement seems to demand that companies will have to form some type of alignment. ◻

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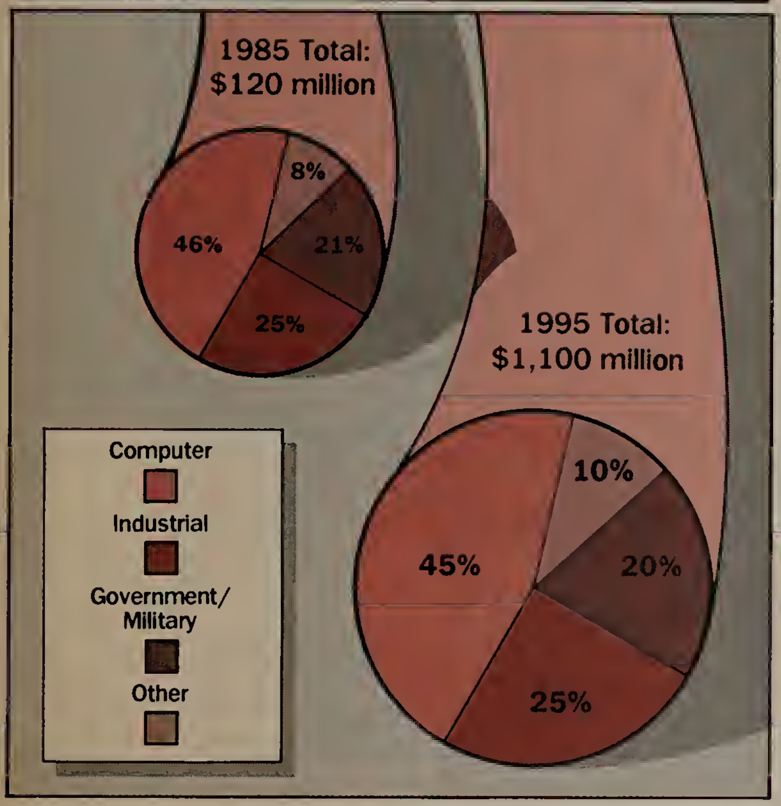
COMMUNICATIONS MANAGER

Network hardware sales

The annual dollar value generated from the sales of local network hardware is expected to increase from an estimated $300 million in 1985 to more than $800 million by 1990. The cost of such hardware on a per connection basis will continue to drop an estimated 16% per year, according to a study conducted by International Data Corp., a Framingham, Mass.-based consulting firm.

U.S. fiber-optic data communications market by application segmentation



SOURCE: KESSLER MARKETING INTELLIGENCE, NEWPORT, R.I.

CAMPUS COMMUNICATIONS

College flies solo

Ohio State swaps Centrex for its own net.

BY MARGIE SEMILOF
Senior Writer

COLUMBUS, Ohio — When Ohio State University opted to trade in its featureless, archaic Centrex One service in favor of a new network, the school not only purchased its own central office switch, it also bought the central office switch site.

The university and one industrial company together used almost 80% of the switch capacity of a nearby Ohio Bell central office. When the two organizations simultaneously decided to install their own phone systems, Dino Pezzutti, director of telephone services at Ohio State, said he figured the phone company would no longer be using the facility. Since the office was located on property adjacent to Ohio State, the university offered to buy the building from Ohio Bell to house its new private branch exchange.

The university also purchased all 57 miles of in-place cable on campus from Ohio Bell. "We basically bought a network that was already up and working," Pezzutti said.

The telecommunications staff at what is the single largest university campus in the U.S. had to think big when planning its communications network. The new $24.3 million network located here will eventually link at least 180 buildings, support some 54,000 students and more than 18,000 faculty and staff members.

Pezzutti said he considered choosing an upgraded Ohio Bell Centrex service. The school was using a No. 5 electromechanical crossbar switch, the last one installed in the U.S., he said.

Instead, the communications staff, wanting to manage its own telecommunications network, bought a Northern Telecom, Inc. SL-100, Northern Telecom's high-end switch, from Ohio Bell Communications,

See **Ohio** page 29

ASSOCIATIONS

"Telecommunications Management — Taking Charge" is the theme of the National Association of State Telecommunications Directors (NASTD) ninth Annual Conference and Trade Show, to be held in Seattle, Nov. 9 to 13.

NASTD members are communications managers of state telecommunications agencies from all 50 states. This year's show will also be opened to members of the northwest chapters of the Telecommunications Association (TCA) and the Data Processing Management Association (DPMA).

For more information, call Theresa Bellinghausen, show manager, 206-453-7977.

Robert Berland, IBM's vice-president of strategy requirements, and James Burrows, a director at the National Bureau of Standards, will address the Computer Security Institute's annual "Event of the Year" security conference, Nov. 17 to 19 at the Atlanta Hilton.

For more information, contact Helen Shimek at the Computer Security Institute, 360 Church St., Northborough, Mass. 01532, or call (617) 393-2600.

The Association for the Advancement of Communications Technology (AACT), whose membership roster will include communications managers, end us-

See **Associations** page 29

GUIDELINES

MARGIE SEMILOF

The future looms bright and busy for ambitious communications managers

Communications carries massive potential to increase the competitive edge of a business and, with the corporate board of directors' continued realization of this potential, many communications managers will eventually vault into the role of communications executive.

William Tallent, a senior vice-president at Telco Research Corp., predicted this upward evolution of the communications manager at last month's meeting of the Southeastern Telecommunications Association. Tallent, a former communications manager at Nashville-based Genesco Corp., told several hundred of his colleagues that their jobs may eventually grow to include more than just management of communications networks. Managers will also teach and lead their organizations in the strategic use of communications tools.

Tallent's message was hopeful — even for communications managers working with companies that have yet to embrace newer communications technologies. He envisioned the communications executive as one who will move network management from a passive to an active role within the organization. "The manager manages facilities and people," he said. "The executive penetrates the company, integrates and applies communications systems."

In addition, the communications executive will continually map out new networking strategies. Planning will become an ongoing process, not an annual activity, he added.

The transformation from manager to executive also means the manager must change his or her overall view of the organization. Managers must avoid focusing on specific communications functions. Instead, a strategic plan must be developed that reflects a concern for, and understanding of, the needs of the entire organization.

Tallent offered his own technique for delineating the roles of communications manager and communications executive. By adopting these qualities, he says, communications managers will become key strategic executives within a corporation.

Communications executives:

- Understand the mission of their organizations;
- Know other key executives within their organizations and understand their missions and motivations;
- Understand the business plan of individual organizational units;
- Spend time with other executives and help them understand the potential of communications technology;
- Spot opportunities to apply communications technology to business problems and opportunities;
- Are opportunity-oriented, not opportunistic;
- Are effective communicators;
- Are businesspersons first, technologists second.

"Managers have the ability to assume the role of communications executive," Tallent said. "They must start by visualizing their role as executive instead of manager."

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Ohio from **page 27**

Inc. The SL-100 is basically a central office switch configured as a PBX.

"We wanted the capability to support any future needs of the university community," he said. "The SL-100 is able to grow to 30,000 ports. There weren't many switches available with that kind of capacity."

As part of the overall network upgrade, Pezzutti said the university is installing at least 835 miles of fiber on campus to handle projected demands for increased voice, data and video transmission. The fiber will be embedded underground in conduits under streets in a star configuration.

Five hubs will be created in the fiber network, creating a distributed star network.

Pezzutti said the fiber network will take advantage of high-speed transmission capabilities expected with future Northern Telecom Meridian enhancements. "Signal speed drops significantly with distance," he said. "By building the network with fiber, we can overcome those distance limitations."

One of the projects that may eventually be supported by the fiber network is a full-motion, two-way video system currently being tested via microwave links, between the university's College of Agriculture and a regional campus located in Wooster, Ohio.

The university will also undergo a yearlong rewiring process. A standard has been adopted that calls for three-pair shielded cable to connect the 180 buildings. Pezzutti said Ohio State's voice and data departments chose this type of cable because it would support increased future transmission needs and protect signal integrity for data transmission applications.

"By using a standard cable," he said, "we know its attributes and what it can support."

Administrative rooms, classrooms and dorm rooms will have a varying number of RJ-11 communications outlets that can be used for either voice or data.

The network is being installed in phases. The first phase will involve cutover of approximately 16,000 stations from Centrex to the SL-100 by year end. Pezzutti said the communications crew — which consists of about 45 switch engineers, operators and technicians — will switch over up to 115 telephone stations each day beginning Oct. 13. Approximately five administrative buildings have already been cut over to the new switch.

From January 1987 to March 1987, special circuits such as private-line data links or alarm circuits will be transferred from Centrex to the SL-100. By March, all Ohio Bell Centrex service will cease.

Pezzutti said the key to pulling together such a large project is planning. The Ohio State communications crew spent approximately five years studying the networking interests and concerns of each department on campus.

"It is important to confer with all involved constituents," he said. "Your chances for success are greater when everyone feels they were involved in the decision-making process."

Associations from **page 27**

ers, consultants, vendors and manufacturers — is being formed to dispense information on technological developments in the telecommunications industry. For more information on AACT, contact William Grolli, associate vice-president for development, State University of New York at Farmingdale, or ACCT President Michael Lackey at (516) 420-2256.

The Data Processing Management Association (DPMA) will hold a free computer career planning workshop for both students and people considering making career changes, Sunday, Oct. 26, at DPMA Atlanta '86.

For more information on DPMA Atlanta '86, call the DPMA at (312) 825-8124.

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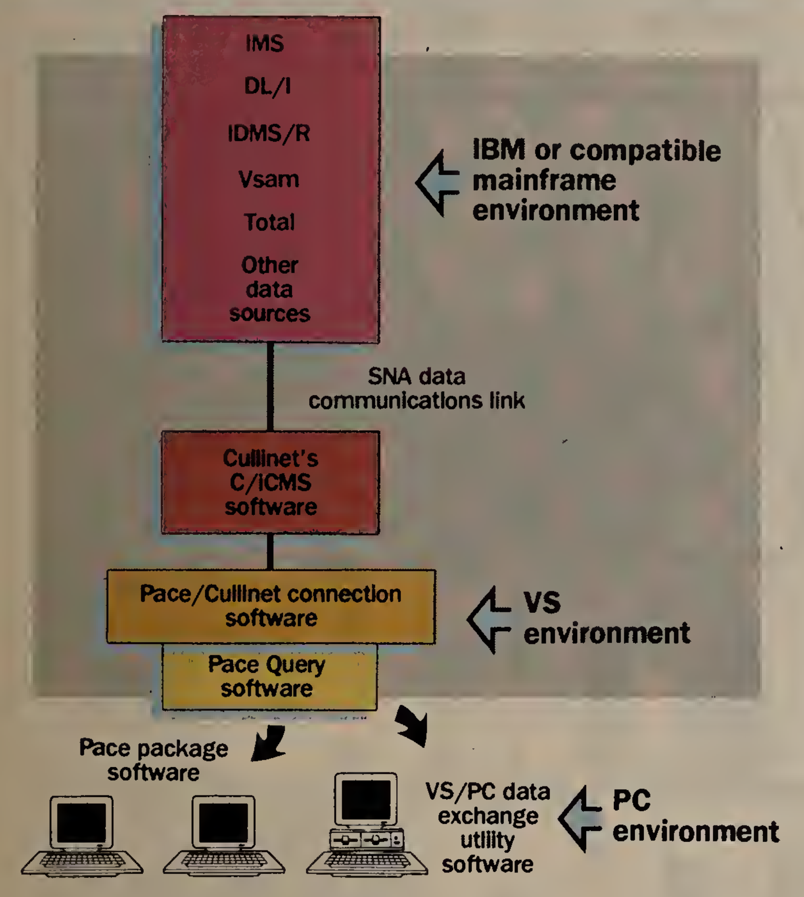
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▶ COMMUNICATIONS SOFTWARE

Wang minis linked to Cullinet tools

System ties VS processors to IBM mainframes with ICMS software.

BY NADINE WANDZILAK
Staff Writer

LOWELL, Mass. — Wang Laboratories, Inc. unveiled software allowing its VS minicomputer systems running Wang's Professional Application Creation Environment (Pace) package to access and download data from IBM or compatible mainframes outfitted with Cullinet Software, Inc.'s Information Center Management System (ICMS).

The VS-resident Pace/Cullinet Connection links to Cullinet's ICMS and ties Wang VS users to Cullinet's Integrated Data Management System/Relational (IDMS/R) data bases as well as IBM's Virtual Sequential Access Method (Vsam) files. The Pace/Cullinet Connection and ICMS also support minicomputer access to data extracts of Vsam files and IBM Information Management Systems, IBM Data Language 1, Cincom Systems, Inc.'s Total and Cullinet's IDMS/R production data bases.

With the announcement, Wang became the third minicomputer vendor to develop a software link tying into Cullinet's ICMS. Earlier this year, Digital Equipment Corp. released its Vida package tying its VAX minicomputers to ICMS ("Interface chasm bridged," *Network World*, May 12). Data General Corp. also released a link from its Comprehensive Electronic Office package to ICMS. Wang, DEC and Data General along with Hewlett-Packard Co. and Prime Computer, Inc. signed agreements with Cullinet in 1984 calling for them to develop ICMS-compatible links.

To find or retrieve mainframe data, Wang VS users prepare a data query using the menu-driven Pace Query facility. The Pace/Cullinet Connection translates the query

See **Connection** page 34

▶ DATA BASE MANAGEMENT

Oracle declares distributed DBMS

*SQL*Star based on IBM's 'R-Star' research.*

BY JIM BROWN
New Products Editor

BELMONT, Calif. — Oracle Corp. jumped on the distributed data base management system bandwagon recently with the introduction of the initial offerings in its SQL*Star distributed data base management system (DBMS) architecture.

The company, known for its Oracle relational DBMS, bills SQL*Star as an open system distributed DBMS.

In other words, in final form, the system will support access to Oracle as well as non-Oracle data bases.

The offering, based on IBM's Structured Query Language, will go head-to-head with rival Relational Technology, Inc.'s Ingres/Star distributed DBMS ("Data base tool links remote sites," *Network World*, June 9). IBM and other major vendors are reportedly at work on distributed versions of their current DBMS offerings.

In theory, a distributed DBMS would allow users and application programs to retrieve data from multiple remote data bases without having to know where the data resides.

Oracle officials said the firm based the SQL*Star architecture on research about IBM's R-Star distributed DBMS project that was published in technical journals. IBM is reportedly working on a distributed DBMS project dubbed Star Burst — a successor to its R-Star project — that is expected to produce a system to tie remote IBM DB2 data bases together.

Despite the commercial availability of distributed DBMSs, users may not be looking to implement such sophisticated technology right now, industry analysts said.

See **Oracle** page 35

▶ DIAGNOSTIC MODEMS

New Infinet modem line out

NORTH ANDOVER, Mass. — Infinet, Inc. recently unveiled a line of integrated diagnostic synchronous modems for use over unconditioned private analog lines or over Dataphone Digital Service lines.

The product line, dubbed IDM, includes four analog models, the IDM 2400, IDM 4800, IDM 9600 and IDM 14.4; and two digital models, the IDM 500 and IDM 556.

Each of the analog devices employs Infinet's IDM or DMX diagnostic side band channel technology to passively measure and report line quality, bit error rates and other information gathered from the data channel.

The side channel technology also supports line testing of data terminal equipment, line loop-back and modem self-testing.

The digital modems transmit diagnostic information along the Dataphone Digital Service (DDS) main channel. When the digital unit's diagnostic module has something to send, the modem inserts the information into unused capacity of regular data transmissions on the main channel, a spokesman said.

The diagnostic information is either fed into Infinet's EMS-II Network Control System, NIS Series 90 Network Information Systems or the modem's front-panel display. According to Infinet, the IDM 2400 and IDM 4800 models offer an asynchronous secondary channel with operating speeds of 150 bit/sec.

Each modem contains a single integrated circuit board and is designed to work as a stand-alone in point-to-point or multipoint networks. They will also be supported in either the EMS-II system or the NIS Series 90 systems. In stand-alone operation, a two-line LCD screen displays configuration options that can be confirmed or changed through touch-sensitive front-panel keys.

When attached to an EMS-II system, each unit supports down-line loaded configuration and control. Both the IDM 550 and IDM 556 are reportedly compatible with AT&T's Channel Service Units and Digital Service Units.

Options for the IDM series include dial backup and a hot spare modem. The dial backup feature forces the modem to call into its destination over dial-up lines when the private line goes down. The hot spare modem is a secondary internal board waiting to take over transmission duties should the

See **IDM** page 35

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▶ TANDEM COMPUTERS

POS systems get on-line link

CUPERTINO, Calif. — Tandem Computers, Inc. is attempting to bring fault-tolerant on-line transaction processing to the retail point-of-sale (POS) environment. The company recently unveiled communications software tying NCR Corp.'s electronic POS terminals into Tandem's Nonstop line of processors.

The Storelink package utilizes a redundant computing scheme that Tandem has had success with in banking applications. Tandem claims the package allows store managers to peek into up-to-the-minute retail sales windows and supports access to credit authorization services.

The number of terminals supported by the package is related to the number of Tandem processors attached to the system. A Tandem system supports up to 16 processors, and up to 14 fully loaded systems can be linked to yield up to 224 processors.

Jointly developed with Signorum, Inc. of Fremont, Calif., and LeRoux, Pitts & Associates, Inc. (LPA) of Clearwater, Fla., the package resides on the Nonstop transaction processor. It is positioned to replace NCR's Stores IV and Stores V packages.

The package supports NCR's Binary Synchronous Communications networking blueprint and talks to NCR electronic POS terminals connected to an NCR 751 terminal controller. It also reportedly can be made to support an IBM Systems Network Architecture environment.

The package is billed as providing flash reporting functions, credit authorization and price lookup functions.

Flash reporting uses up-to-the-minute activity captured from connected terminals to prepare daily sales reports. The report can be a total view of the day's activity or can be isolated to one group of terminals.

The credit authorization capability directly connects the Nonstop to a variety of third-party credit authorization services. The function reportedly trims costs for accepting credit or debit cards at the POS, including lesser used private label cards, by sidestepping intermediate clearinghouse services to connect to credit authorization services directly.

The price lookup feature allows terminal users to search the host's data base for an item's price.

The Storelink package will be available early in 1987 and will carry a price tag starting at $125,000.

Connection from **page 31**

into a format readable by the Cullinet ICMS. The ICMS passes the request to its Information Data Base (IDB) component, which checks it against a catalog of files that can be downloaded, locates the information and passes it back to the Wang environment where it is translated to Pace format.

Data retrieved from the mainframe can be combined with Pace resident data or can be passed to a personal computer connected to the Wang VS system over Wang's PC/VS Data Exchange Utility.

The VS-to-mainframe link requires three VS software facilities, including VS 3274 emulation software, a Pace Query bridge and the Pace/Cullinet Connection.

The Pace/Cullinet Connection will be available in December.

The software price is based on the VS system and ranges from $5,000 to $15,000.

Responsible for connection, monitoring and control of data communications networks?

Try this network quiz.

1. Does your present network allow interconnection of all your data devices? Yes ☐ No ☐

2. Is performance—throughput and resource usage—at optimum levels? Yes ☐ No ☐

3. Is your user interface simple enough and management info complete enough that the "HELP" phone is rarely needed? Yes ☐ No ☐

4. Can you add devices without a network SYSGEN? Yes ☐ No ☐

5. Is your current network architecture an "open" one that prepares you for the current move toward standardization? Yes ☐ No ☐

If you've come up with a "No" or two, you'd best look into Vitalink's TransLAN. Because TransLAN is your key to:

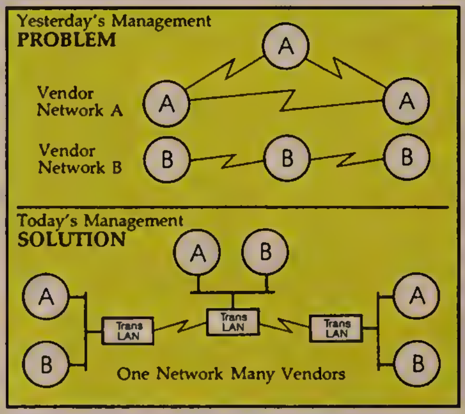
Simplified LAN interconnection and vendor independence

TransLAN lets you simply and cost-effectively link individual LANs into a *single*, coherent and *geographically unlimited data network.*

A true ISO Link Layer Bridge, TransLAN extends IEEE 802 protocols into a Wide Area Network. Because *all* stations appear to be local, any LAN station can communicate with other like stations on the bridged network. TransLAN also automatically learns the address of each station, filters out local traffic within the resident LAN, and forwards across the bridge only communications to and from remote destinations. Among the benefits, of course, are easier user interfacing to the network and simplified network management.

The elimination of geographic barriers

TransLAN interfaces with microwave, fiber-optic, satellite, dedicated and switched telephone (voice and data) circuits. And automatically builds the most efficient communications pathways.



Because geography becomes irrelevant—and the TransLAN bridge is transparent to each station on the system—you've ended forever the typical awkwardness of LAN interconnection.

"SYSGEN-less" network changes

Beyond easy assembly, TransLAN bridged networks offer automatic adaptation to new network configurations—*no SYSGEN needed.* That streamlines alterations, rearrangement of station locations and adding of new stations. The resulting simplified management is enhanced by your ability to easily acquire statistics, diagnose problems and gain insight into each network location—from any network point.

Proven operation, proven price/performance

TransLAN is no experiment. It's at work in hundreds of locations worldwide. Supporting all Ethernet or IEEE 802 compatible products with *throughputs in excess of 1500 packet/sec.* Allowing incompatible devices to use the same network. Actually providing remote communication capabilities to any two similar devices able to communicate on a single LAN.

Obviously, you'll want to know more about how TransLAN can put a "Yes" answer on each question above. Call the TransLAN Support Staff today or send this ad and your business card to:

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COMMUNICATIONS CORPORATION
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Mountain View, CA 94043
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Four Color Graphics; Palacio; 7-3-86sm (7-3-86; jp)

Oracle from **page 31**

Issues such as maintaining data integrity, data update synchronization and network response time still hinder the distributed DBMS in practice.

"How are you going to guarantee the correctness of your data in an environment where there's a lot of updating and you've distributed parts of the data base to different machines," asked Ronald G. Ross, editor of *The Data Base Newsletter*.

"People are waiting for IBM to bless the distributed data base environment with its R-Star," said Shaku Atre, president of Rye, N.Y.-based Atre International Consultants.

Oracle's product addresses some user concerns, but leaves others hanging until later releases next year. The SQL*Star offering comprises Release 5.1 of the Oracle DBMS — dubbed Distributed Oracle — SQL*Net and SQL*Connect.

Distributed Oracle runs on each computer in the distributed architecture. It supports SQL-based query processing and maintains a dictionary of all data bases in the distributed system. The package examines queries to determine data location and sends retrieval messages.

Versions for Digital Equipment Corp.'s VAX/VMS, IBM's VM/CMS and PC-DOS are immediately available. Versions for MVS and Unix will be released in December.

Base Distributed Oracle fees are $1,000 for a personal computer, between $24,000 and $96,000 for minicomputers and up to $160,000 for mainframes.

The SQL*Net component prepares requests for remote data base access into the format needed to run over the network linking different computers.

Versions of SQL*Net to support Decnet, local and dial-up RS-232 asynchronous connections and Personal Computer-to-VM operating system connections are available now. Versions tying into Transmission Control Protocol/Internet Protocol, IBM's Systems Network Architecture and LU 6.2 Advanced Program-to-Program Communications are expected in December, and a Manufacturing Automation Protocol version is planned for 1987.

Oracle plans to release an SQL*Net tool kit in December that will enable internal systems engineers or programming consultants to customize packages for other nets.

The SQL*Connect component provides gateways to non-Oracle data bases. Currently available is a gateway to IBM's SQL/DS. Support for IBM's DB2 is expected in December, and support for IBM's Vsam and IMS is expected in 1987. A SQL*Connect tool kit is also planned for 1987. SQL*Connect gateways to SQL/DS and IMS add 25% to Distributed Oracle fees.

SQL*Star is primarily for multisite querying in current versions. Distributing updates to multiple data bases can be done, but Oracle warns that DBMS backup and recovery facilities may not work with multiple updates. ◘

IDM from **page 31**

primary board fail. The spare board is in constant self-test mode until needed.

Optional add-on cards

With an optional add-on card, the IDM 14.4 can double as a six-channel time division multiplexer. Another optional add-on card turns the IDM 9600 into a four-channel time division multiplexer.

The IDM 2400 operates at 2,400 bit/sec or 1,200 bit/sec. The IDM 4800 operates at 4.8K bit/sec. The IDM 9600 operates at 9.6K bit/sec, 7.2K bit/sec or 4.8K bit/sec. The IDM 14.4 operates at 14.4K bit/sec, 12K bit/sec or 9.6K bit/sec. The IDM 500 operates at the DDS subrates of 9.6K bit/sec, 4.8K bit/sec or 2,400 bit/sec while the IDM 556 operates at 56K bit/sec.

Each one of the models operates in half- or full-duplex over four-wire leased lines.

The analog models use quadrature amplitude modulation, with the exception of the IDM 14.4, which also uses 8-state trellis-coded modulation.

The digital models employ the baseband bipolar AT&T specification for the DDS.

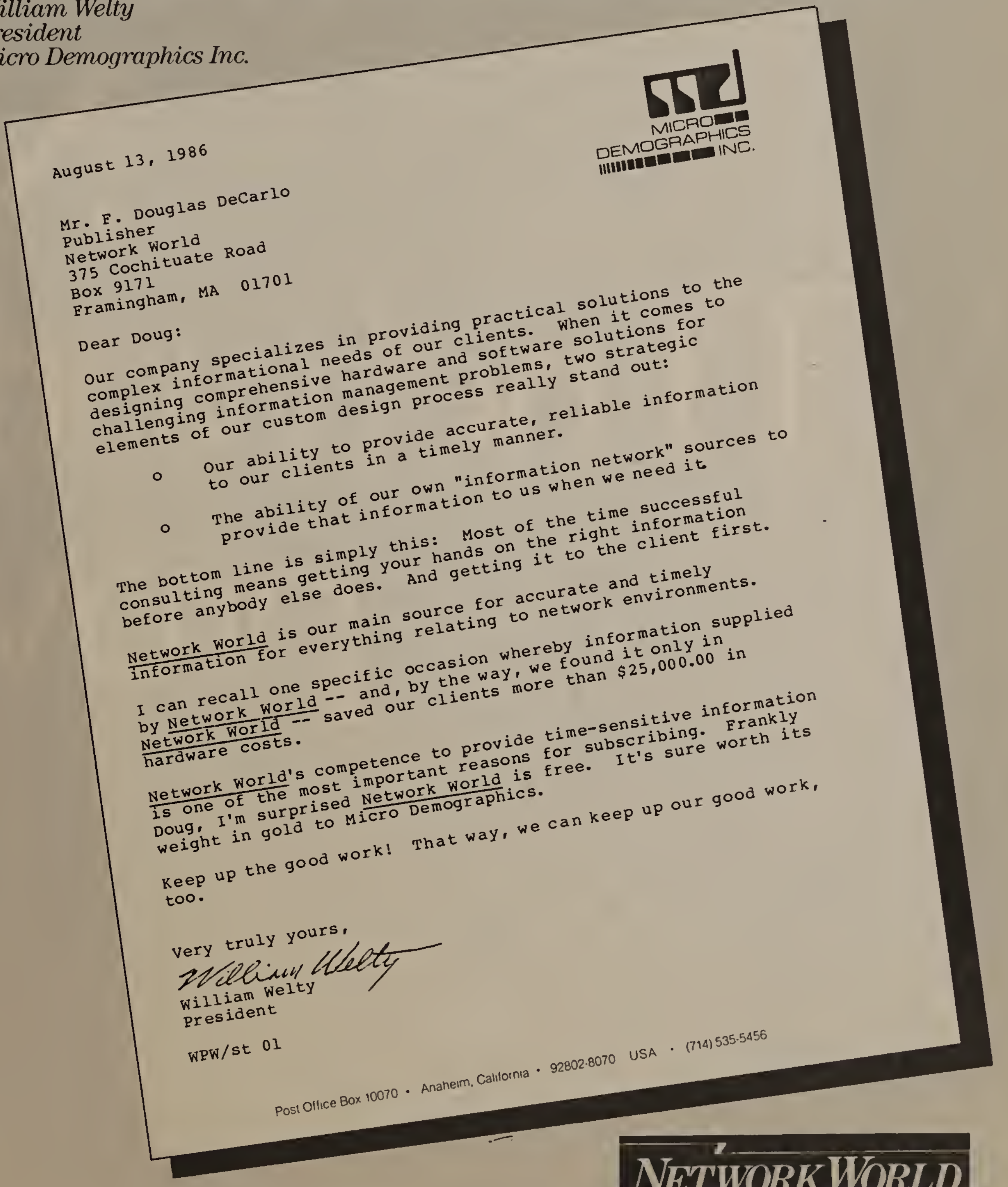
With the exception of a V.35 terminal interface on the IDM 556, each unit also features RS-232-C and CCITT V.24/V.28 terminal interfaces.

Prices for the analog IDM units range from $1,550 to $6,000. The IDM 500 is priced at $1,895, and the IDM 556 is priced at $1,995. The units are expected to be available in November or December. ◘

> *"Each one of the models operates in half- or full-duplex over four-wire leased lines."*

"...information supplied by *Network World*—and, by the way we found it only in *Network World*—saved our clients more than $25,000 in hardware costs."

William Welty
President
Micro Demographics Inc.



MICRO
DEMOGRAPHICS
INC.

August 13, 1986

Mr. F. Douglas DeCarlo
Publisher
Network World
375 Cochituate Road
Box 9171
Framingham, MA 01701

Dear Doug:

Our company specializes in providing practical solutions to the complex informational needs of our clients. When it comes to designing comprehensive hardware and software solutions for challenging information management problems, two strategic elements of our custom design process really stand out:

○ Our ability to provide accurate, reliable information to our clients in a timely manner.

○ The ability of our own "information network" sources to provide that information to us when we need it.

The bottom line is simply this: Most of the time successful consulting means getting your hands on the right information before anybody else does. And getting it to the client first.

Network World is our main source for accurate and timely information for everything relating to network environments.

I can recall one specific occasion whereby information supplied by Network World -- and, by the way, we found it only in Network World -- saved our clients more than $25,000.00 in hardware costs.

Network World's competence to provide time-sensitive information is one of the most important reasons for subscribing. Frankly Doug, I'm surprised Network World is free. It's sure worth its weight in gold to Micro Demographics.

Keep up the good work! That way, we can keep up our good work, too.

Very truly yours,

William Welty

William Welty
President

WPW/st 01

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NETWORK WORLD

The Weekly for Leading Users of Communications Products & Services
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A PUBLICATION OF CW COMMUNICATIONS

How great is the competitive advantage N.E.T. T1 networking provides?

So great our customers want to keep it quiet.

Our customer testimonials would be vastly more effective here in this space than our claims about successful private networks.

But our customers don't want their networking successes publicized.

They don't want their competition to know.

So we can't tell you who our customers are in print. But we *can* tell you what they're being so secretive about.

Our IDNX™ transmission resource manager enables our customers to consolidate voice and data traffic over the same network, making for a more manageable, *reliable* communications system. A significant advantage.

T1 private networks based on our IDNX transmission resource management equipment cut communications costs so substantially, payback is generally under a year and return on investment is better than owning blue chip stocks. That makes our customers much more competitive.

But cost savings are only the start. Consider providing new, innovative, competitive communications delivery options—to your company and to your customers. Because with the IDNX system, you will have new tools to create new solutions and improvements that were, until now, simply not economical.

Heady claims, and a number of vendors are making them. Too few can back their claims with success stories. We can. But not in this ad.

Here's what puts N.E.T. customers ahead:

First: *Functionality.* Data. Voice. (Including compression.) Video. The ability to integrate *any* equipment into an intelligent, expandable private network. With more features and capabilities than alternative equipment. Compare.

Second: *Compatibility.* With existing communications standards. With the emerging ISDN standards. And with all major T1 common carriers. Again, compare.

Third: Unequalled *reliability.* Our technology, through designed-in, nonstop redundancy and an intelligent, self-healing network architecture means our customers' critical applications have *higher availability*—the true measure of reliability. We invite comparison.

Fourth: Our *service.* Beyond maintenance, a system that can be diagnosed quickly, from your offices or our 24-hour-a-day, seven-day-a-week Technical Assistance Center. Down to the board level on any network node. Service that extends to network design and planning. Service that makes the task of building a private corporate network *practical.* Compare.

Finally: Our *proven* success. With installations all over the U.S., we have solved the thorny problems that are still merely on paper at most of our competitors. By all means, compare.

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Network Equipment Technologies has applied for trademarks for Network Equipment Technologies and IDNX.

Opinions

IBM

BRIAN JEFFERY

"If I were John Akers . . ."

There is a popular belief that IBM-watching revolves around plying IBM executives with booze at cocktail parties and listening to them as they loosen their ties and say: "Well, between you and me . . ."

Unfortunately, this is not how it works. Most of the time, speculating about IBM involves hard work and hard thinking. That, and occasionally starting a conversation with, "Now, if I were John Akers . . .

"I'd be getting a little concerned about IBM's telecommunications business. This is, after all, where much of the IBM growth is going to come. I've been listening to what the Systems Network Architecture guys have been saying: 'Complex proprietary networks are where it's going to happen, and the growth is going to be in providing software, management and systems integration services, workstations and distributed processing systems.'

"The problem, though, is whether IBM is letting some of its earlier commitments get in the way of this goal. I authorized the acquisition of Rolm Corp. a few years back because IBM was already in so deep with Rolm, it was either go all the way or write off the whole thing. Rolm hasn't exactly worked out, however. Last year it lost close to $100 million for IBM, and this year it looks even worse. The financial people have been complaining about that, and the corporate management board isn't too happy either.

But as I, John Akers, sip my morning coffee, Rolm isn't my greatest concern. I'm more worried about end users not going for Rolm. Lord knows, we've tried everything — almost giving away CBX IIs. We've put them in all over the place within IBM. The market, though, isn't buying Rolm. AT&T had more leverage with the telecommunications departments than we thought, and those System/85s and System/75s are moving well. We're going to have to support the AT&T equipment if we're going to make it in this large network business. Can we really afford to let Rolm boxes get in the way?

"Then there's this local-area network business. This is the kind of detail that I, John Akers, should not be getting into. But I'm concerned; we spend $2 billion on research and development, and we can't even come up with something that'll run more than a few hundred feet over telephone wire.

"It's embarrassing. It may also be serious. So far, we've got only the True-Blue shops to go along with it, and even they're not too happy. The rest of the market is sitting it out. That AT&T thing, Starlan, has the IBM communications products people down there in Raleigh, N.C., worried — it's not taking off. It's obvious, though, that a lot of the action in local-area networks is going to involve this unshielded twisted-pair stuff that we're working on right now. We could lose this one, and I'm concerned.

"Decisions, decisions. It's tough, being chairman, chief executive officer and president of IBM. The fact is, we've got trouble. Even Wall Street has noticed. Maybe we should be going back to basics here. If we're right about this network business, about the very large proprietary environments — and we are — maybe staying tied to Rolm and that token ring is going to undercut some of the bigger opportunities here. We need to raise the ante, get out of boxes and wiring.

"Raise the ante? Where have I heard that before. It's what the finance people kept saying about Satellite Business Systems. Too small to compete on its own. Need to find a partner. I'm thinking hard now. This is what they pay me for. This is John Akers in action. Where is that memo from World Trade about finding a European telecommunications partner? Here it is. 'Need to have [Integrated Services Digital Network] capability, need to cover the central office base, need . . .'

"From what the Raleigh people have been saying, we're going to need all of those capabilities in the U.S. too. We're also going to need a systems integration organization.

"Suppose we could come up with a partner that could use Rolm the same way MCI [Communications Corp.] could use Satellite Business Systems? Tie it into this Europe business, and we could kill two birds with one stone. That doesn't solve the token-ring business, though. Maybe I'm looking at this the wrong way. We're just starting out with the token ring. It wouldn't be too late to back off . . . Better still, we could raise the ante the way we did with SBS. Maybe pull off something big, tie together all of this local net, PBX and ISDN business with a new partner. Get out from under this token-ring commitment while we can.

"Radical problems require radical solutions. Funny thing is that IBM has surprised people many times by raising the ante on problems, and they're still surprised."

Jeffery is research director at the International Technology Group in Palo Alto, Calif.

PRIVATE BRANCH EXCHANGES

JEFFREY M. KAPLAN

4th generation: lacking

The news out of Ztel, Inc. these days is not good — more layoffs, more rumors of impending doom.

Ztel was borne out of the seemingly boundless potential of the AT&T divestiture. It boasted a new generation of private branch exchanges aimed at solving users' voice and data communications needs. Yet, despite its impressive technology and the supposedly obvious demand for its integrated voice and switching capability, Ztel's demise seems inevitable.

Whether or not the ax does finally fall on the would-be fourth-generation PBX vendor, the lessons of its rapid rise to industry prominence and its unfulfilled promise are worth underscoring.

Ztel arrived amid the confusion and opportunity created by the AT&T divestiture. Although the company was actually incorporated before the official breakup of AT&T, Ztel's inception was based on the enormous potential that the divestiture guaranteed.

Under the divestiture plan, users would no longer be tied to AT&T and its Bell operating companies for their basic communications needs. They would be free to buy equipment and services from any source they pleased. They no longer had to accept the inefficient services offered by the BOCs or the outmoded equipment that AT&T provided.

AT&T could see the handwriting on the wall long before U.S. District Court Judge Harold Greene's Modified Final Judgment forced the company to relinquish its BOCs in order to keep its highly profitable long-distance services network.

In the late 1970s, AT&T began to distance itself from the local operating companies and their antiquated services, such as Centrex. Instead, it chose to promote the PBX as an on-premise alternative that could give users greater control over their telephone costs.

Other companies also recognized the opportunity that was just over the horizon. Companies such as CXC Corp., Intecom, Inc. and Ztel emerged in the early 1980s, boasting a new level of PBX functionality.

In addition to switching voice messages, the traditional domain of the PBX, these new companies claimed that their systems could also handle data simultaneously. The advantages were obvious. It would be more cost-effective for a user to switch both voice and data through a single switch over a single set of lines than to build separate dedicated networks for each.

The PBX had already gone through three technological phases. It was conceived as a voice-only, analog-based switching system with hard-wired logic. The second-generation systems included stored-software program logic control that permitted greater switching intelligence. Third-generation technology was digital, offering more functionality and limited voice/data switching capabilities through add-on applications processors.

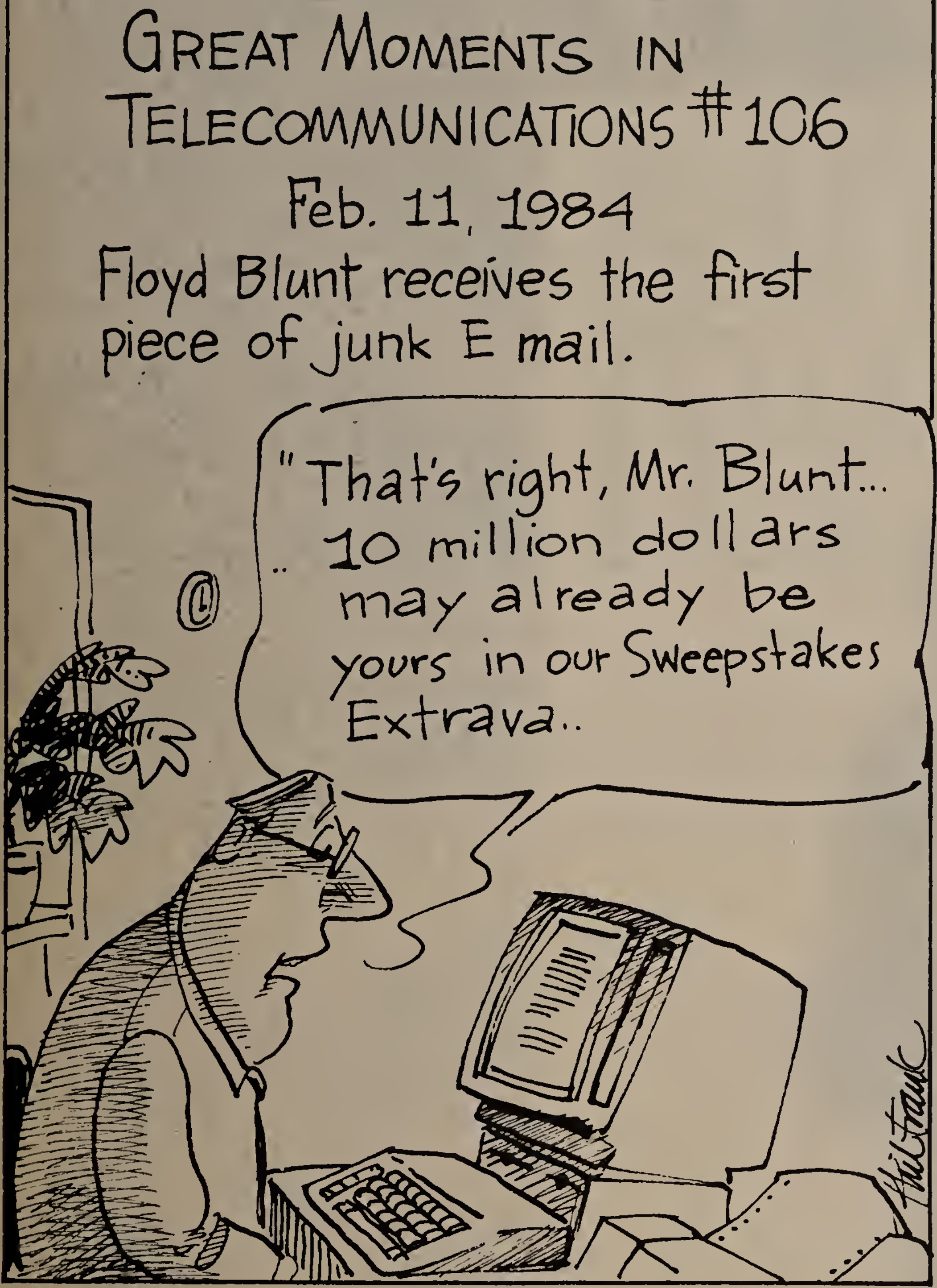
Fourth-generation PBXs promised to supercede previous technologies by adding networking capabilities to the simple voice and data switching that characterized earlier systems. These new systems also promised to perform the voice and data switching in a single box.

These fourth-generation systems helped to differentiate the new entrants from the established PBX players that dominated the market. The new vendors became the glamour boys of the industry. They appeared to have technology that could make users' lives easier.

Although AT&T, Northern Telecom, Inc. and Rolm Corp. could not match the additional system capabilities promised by the new companies, they claimed that they

Kaplan is the client service manager and senior market analyst of communications industry research programs for International Data Corp. in Framingham, Mass.

▶ TELETOONS — By Phil Frank


GREAT MOMENTS IN TELECOMMUNICATIONS #106
Feb. 11, 1984
Floyd Blunt receives the first piece of junk E mail.
"That's right, Mr. Blunt... .. 10 million dollars may already be yours in our Sweepstakes Extrava..
@
Phil Frank

could. They learned that, through effective marketing communications, they could make their own promises to users. Their ability to follow through on their promises was a secondary concern to maintaining their hold on the customer. It was a classic marketing ploy.

It soon became difficult for users to separate one vendor from another, since all of the vendors made similar promises about PBX capabilities. They all began to call their products fourth-generation systems, and all claimed that their PBXs offered integrated voice/data capabilities. The problem was that none of the vendors was able to perform these feats.

Building a truly integrated voice/data PBX proved to be much more difficult than anyone had ever expected.

The sophisticated switching system required thousands of hours of software programming. And the proprietary very large-scale integration chip technology that powered these systems was tremendously expensive to develop.

The new entrants lacked the financial resources to see the product development process through. They were in a catch-22 situation. As the product development cycles grew longer and increased financing became necessary, the companies' financial positions became more precarious. They had no other products to bring in revenue.

These vendors also lacked the necessary channels of distribution to market their new products and an installed base of users to absorb them. In addition, they lacked the name recognition and market credibility needed to overcome these limitations quickly enough to offset their overwhelming product development costs.

Yet those problems all were secondary to the overwhelming problem of getting a full-fledged product to market. Out of the new generation of PBX vendors, only Intecom was able to deliver a voice/data PBX with some networking capabilities. CXC and Ztel lost credibility in failed beta tests and finally brought to market undistinguished third-generation systems.

The established PBX vendors, on the other hand, were handcuffed

See **PBX** page 44

INDUSTRY INTEGRATION

WALTER ULRICH

Can one firm do it all?

Choice in the telecommunications marketplace is good because it reflects innovation and competition and serves to reduce prices and improve performance.

Choice, however, is a double-edged sword that also brings complexity and causes confusion. For example, any comprehensive guide to communications products and services runs several hundred pages.

Information overload is epidemic in the communications industry, and no communications manager can hope to stay current on all products and services. However, there are now several industry trends that have important implications for users.

First, communications technology is clearly moving toward integration. Twenty years ago, data communications was no more than a concept.

In today's network, it is hard to find where voice leaves off and data begins. The distinction between information systems, office systems and network systems is blurring.

Second, the corporate communications function is evolving into a full-service information system department. Chief information officers are being appointed to provide a full spectrum of information, communications and office services to their users.

Third, market trends mirror technological and customer trends. Vendors are diversifying product lines in order to provide a full range of services to their users.

For example, AT&T's offerings now include data processing products; IBM has acquired switchmaker Rolm Corp.; and Wang Laboratories, Inc. has acquired private branch exchange manufacturer Intecom, Inc.

This trend is also occurring in the consulting industry. Walter Ulrich Consulting has just been acquired by the Big Eight accounting firm Coopers & Lybrand.

Another consulting firm, DMW Group, Inc. of Ann Arbor, Mich., recently merged with Commercial Software, Inc. of New York. The new firm, DMW Commercial Systems, Inc., will offer network management systems for voice products as well as consulting services.

These business mergers and acquisitions are key milestones that reflect a new direction among companies offering network products and services.

The communications industry first became competitive in the early 1970s. Pioneering communications companies focused on single-product areas where they could achieve price, performance and functional superiority over AT&T and a few other dominant vendors.

Many of today's large vendors began by concentrating on a narrow band of products. Examples in voice services include MCI Communications Corp. and Southern Pacific Communications Co. Southern Pacific later became United Telecommunications, which joined GTE to establish US Sprint Communications Co.

Other cases are Tymnet, Inc. and Telenet, Inc. in data communications; Rolm and Northern Telecom, Inc. in the PBX market; Racal-Milgo, Inc. in the modem market; and many others.

These niche products were readily accepted by network managers who would segment their requirements at each point in the network and select products accordingly.

Today, communications managers have a much broader array of requirements and many more products to examine. Unfortunately, products can no longer be easily segmented for comparison. Entire solutions must be compared and contrasted, and there is no end to the number of combinations.

Communications managers are becoming more sophisticated, and they are tired of familiarizing new vendors with their technological environments, business situations and procurement policies. As a result, they are turning from narrow band vendors to full-spectrum suppliers.

Full-service vendors say they help their customers look at complete solutions, while niche vendors specialize in one area and sometimes become more expert in that area than larger, integrated vendors do.

No communications manager wants to be dependent on just one supplier for all information

See **Integration** page 52

Ulrich, a partner in Coopers & Lybrand, manages the firm's Walter Ulrich Consulting subsidiary in Houston.

SOMETHING BRILLIANT JUST HAPPENED TO DATA TRANSMISSION.

Introducing Public Data Network* from the Bell Atlantic Network Services Group. A startling communications development that's just made other interactive data transmission modes seem all but obsolete.

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Public Data Network offers the benefits of packet switching—through the telephone network—at speeds up to 9600 bps. By batching data into electronic "packets," Public Data Network is ideal for "bursty" applications like order entry, billing, information processing, credit approval, reservations, ticket sales and claims.

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And because Public Data Network supports X.25 and asynchronous protocols, it's the perfect link between dissimilar data processing equipment. Like office and home computer terminals and multiple data bases. It also opens the door for electronic banking and electronic shopping and a long list of other interactive electronic subscription services.

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From voice circuits to a variety of digital data services including High Capacity Digital Service and fiber-optic-based High Capacity Lightwave Service, we offer full duplex dedicated and switched digital data transmission at speeds ranging from 300 bps to 560 megabits. On a point-to-point or multi-point basis.

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Without optimized network transmission capabilities, your communications system is handicapped. That's where we come in. By applying our most valuable asset—our network expertise—we can unlock your system's potential, adding value through increased operating efficiency.

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NETWORK WORLD

Features

October 6, 1986

Intelsat's Richard Colino
As head of the world's largest satellite cooperative, Richard Colino represents the interests of 112 nations. Colino's task of juggling diplomacy, policy and technology is not an easy one. He has developed some definite opinions about satellite industry deregulation, the Federal Communications Commission and the TAT-8 fiber-optic underwater cable. **Page one.**

Local net software approaches legal crossroads
Using software on a local-area network without express consent from the vendor can spell trouble for users. Under current copyright law, a vendor could make a case that local network use constitutes illegal copying and distribution. Rather than risk losing their software and paying damages, users should negotiate specific licenses for network use. **Page 45.**

IBM's Token-Ring quietly infiltrates the marketplace
After a year in operation, IBM's Token-Ring Network is recognized as a milestone and a standard setter. Major users give a mixed report but see the product as a long-term contender in the marketplace. **Page 49.**

FEATURE FOCUS

Intelsat's Richard Colino

Continued from page 1

ters is not from propagation problems, Colino says, but rather from U.S. deregulation policies.

Intelsat and the U.S. government have been butting heads over the U.S. plan to encourage limited competition to Intelsat — a plan Colino says can only have an adverse effect on U.S. communications and information-service users.

"When you start to talk about putting up satellites that can offer the same services Intelsat offers, what does that accomplish? The answer from the U.S. is that it wants the consumer to get a better price. Well, if you want to do that, don't try to screw up an international cooperative pattern that's worked for 25 years, and [instead] clean up your own act," he says.

"Solve your own domestic problems," Colino counsels. "[Laying your problems on everyone else] creates problems for your partners because in international communications there's got to be a guy [in another nation] at the other end, and you're making his life miserable. And he doesn't have to believe in your philosophy."

If U.S. policy makers are a thorn in Colino's side, then the Federal Communications Commission is a virtual pricker bush of adversity. "If prices are too high," Colino says, "you've got something called the FCC. Tell the carriers to reduce

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PHOTO © 1986 LEE McDONALD

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their prices. Isn't that your job, FCC?"

The origins of Intelsat date back to 1962 when President John F. Kennedy signed the Communications Satellite Act to provide telecommunications services via satellite to all parts of the world. In 1965, the cooperative launched "Early Bird," the world's first commercial satellite, which served 15 users with 75 full-time telephone circuits. Today, with a network of 15 orbiting satellites, 170 Intelsat users take advantage of more than 36,000 circuits.

Intelsat faces a new batch of challenges, however. As Colino sits back in his chair, he seems to enjoy a challenge the way he enjoys a good cigar. Topping his list is the recent U.S. pro-competition satellite policy.

"U.S. policy is not a pro-competitive policy in the least bit. It's a policy of theft. They want to steal from our system the traffic we would normally get," Colino says. "Why do I say that? Because I haven't seen a separate system propose new services."

Colino asserts that the U.S. is so anxious to get these new satellite entrepreneurs off the ground that it is bending over backwards for them. All the indirect help from the U.S. government will eventually enable these start-ups to provide users with less expensive satellite services than Intelsat can offer.

"Why would they be able to offer satellite services cheaper? Because they've got a partner called [FCC Chairman] Mark Fowler, and their partner is not regulating them," Colino says.

Although Colino has strong opinions about the "artificial competition" induced by the U.S. government, he says he welcomes genuine competition from nascent technologies. "New technology gets out in front and says, 'Get out of my way.' That's healthy, that's real."

Intelsat is preparing for the advent of Integrated Services Digital Network with the introduction of its Intelsat Business Service (IBS). Transmitted internationally over C-band and K-band frequencies, IBS offers a variety of digital services, such as electronic document distribution, audio and video teleconferencing and electronic funds transfer, at bandwidths ranging from 64K to 8.5M bits. Colino calls IBS "a precursor to ISDN" and says companies can use the service to build ISDN capabilities.

Higher up on the spectrum of new technologies is Ka-band, which Colino says is still about 10 years away. Although Ka-band offers the potential of more efficiency on smaller, less expensive earth stations, signal propagation problems beleaguer the step up to 20G to 30G Hz bandwidth right now.

"If one of your objectives is to have low-cost earth stations, you've got to make sure they work all the time. If you start having backup facilities, it just makes [the move to Ka-band] Mickey Mouse instead of efficient," he says.

Colino also predicts that earth stations will shrink to 10% of their size within the decade. Direct broadcast satellites (DBS) are expected to make a comeback in the next century, says Colino, but he doubts that the technology will ever become widespread. "Most of the world doesn't need DBS. In fact, what do you get when it's all said and done? Four channels? What do you want four channels for?

"People want a service — they don't give a damn how it gets there. They'll tie chicken wire to their rooftops if you give them the service," Colino continues. "Only technologists get excited about technology for its own sake."

Colino says that developments in fiber-optic technology have actually driven Intelsat to improve its own technology in terms of modulation techniques, efficiency of the spectrum, higher powered satellites and lower cost earth stations.

But in spite of all the recent advancements in satellite technology, Colino admits Intelsat will face a formidable fiber-optic foe when the eighth transatlantic underwater telecommunications cable becomes operational in 1988.

TAT-8, as the cable is called, is a 31,000-mile, $335.4 million endeavor led by AT&T that threatens to draw users away from satellites. "So we're going to take a little gas in the first few years of TAT-8, and we're going to lose some potential circuits." On the other hand, Colino says, "I think we're going to win some back with our technology.

"The advantage of fiber optics over satellite technology is over shorter distances. That's where it delivers broadband capability at lower costs per mile."

Another reason users may stray away from satellites is the number of recent launch failures. Intelsat's latest attempt to send a satellite into space this year ended up in flames as the French launch rocket — the Ariane 2 — plunged into the Atlantic Ocean after its third stage failed to ignite. On board was the $50 million Intelsat V F14 telecommunications satellite, due to orbit the equator carrying 15,000 telephone circuits and two color television channels. Intelsat also lost a satellite earlier in the year in the U.S. Challenger space shuttle explosion.

Since June 1984, Intelsat has recouped approximately $200 million from its $20 million-deductible insurance policy for the destroyed satellites. "Eventually someone has to pay for it. Usually the consumer pays for it," Colino says. "In our case, we have not seen our premiums increase because we locked in our insurance years ago before any of this happened."

Lloyd's of London is Intelsat's primary underwriter, and according to Colino, the satellite cooperative is insured through the remainder of the Intelsat V program, with about a third of the upcoming Intelsat VI program covered.

Because of the number of insurance companies going bankrupt and the rising cost of premiums, Colino says he is leaning toward dropping all the insurance coverage for the Intelsat VI program and suggests that the cooperative insure itself. "Even though we've had two failures in the last two years, we still have a much higher success ratio than we planned into our original programs. Before I would recommend paying the kind of premiums that other people are paying, I would take the gutsy move of self-insuring," he says.

The rash of accidents has made launch vehicles scarce. After the shuttle disaster, the U.S. Department of Transportation pulled the National Aeronautics and Space Administration (Nasa) out of the launch vehicle business, hoping that private companies would pick up the slack — in particular, Martin Marietta Data Systems, Inc. and General Dynamics Corp.

"The issue is that without government support, what will these companies have to charge to make this a business? And who's going to pay for the development costs? I'm not saying they will be expensive, but I'd be mighty surprised if the private sector is going to run it at a loss," Colino says.

So what's a director general of an international satellite cooperative to do to get his birds in flight? Intelsat has many options, Colino says, and it does not have to rely on the U.S. government for lifts into space. "I've got lots of choices. I have a Chinese launch vehicle and a Russian launch vehicle and maybe a rocket from Japan in 1992," Colino says.

"Isn't this the same government that wanted competition?"

PBX from **page 39**

by their cumbersome organizational structures. They were unable to react quickly to the new market opportunity. Justifying the additional product development costs of upgrading their PBX systems to meet an undefined market need was difficult in a highly structured corporate environment. So, making vague promises proved to be a more cost-effective method of preventing their current PBX users from abandoning them.

These established vendors also had the benefit of existing cash flows from diverse product lines. AT&T and Northern Telecom's central office equipment revenues were booming as the BOCs upgraded their local networks to fight off the PBX challenge. This gave them deep pockets to finance their product development efforts.

Meanwhile, users quickly realized that PBX systems that emerged after the AT&T divestiture offered less than they expected. The proliferation of products and vendors forced users to extend their PBX procurement cycles to thoroughly evaluate all of the available alternatives.

Further complicating users' decision making was the resurgence of Centrex services. The BOCs used the PBX vendors' failure to offer a full-fledged fourth-generation system as an opportunity to promote their service alternatives.

Using their own brand of hype, the BOCs began boasting of the data communications capabilities of their central office-based services. Traditional Centrex services became "enhanced" Centrex. The utopian world of Integrated Services Digital Network became the BOCs' calling card.

The strategy worked. Users have turned to Centrex as an interim solution to meeting their voice communications needs while they sort out the PBX alternative. And data transmission services have gained popularity.

The clock has run out for fourth-generation PBX vendors. Ztel is struggling to find new financial backers. CXC has abandoned the PBX market and is now selling automatic call distribution systems. Intecom is a financially troubled subsidiary of Wang Laboratories, Inc. Even newer entrants SRX, Inc. and Cyber Digital, Inc. are facing serious financial problems. Meanwhile, established vendors have quietly changed their approaches to the integration issue. They now offer evolutionary, rather than revolutionary, solutions to users' voice and data needs.

IBM and Rolm have finally succeeded in jointly producing a series of products aimed at integrating voice and data requirements. Recent enhancements to Rolm's Phonemail that tie the system to IBM's text-processing systems are a good example of this success.

AT&T's Information Systems Network has been designed to connect to its System/85. Northern Telecom's Meridian series offers added data communications capabilities. The irony is that this evolutionary approach is much safer and is likely to be a much more profitable method of meeting users' needs. Product development costs are not as severe, and the impact of new systems on vendors' installed bases will be less traumatic. Users need no longer worry about revolutionary new technology making their existing PBXs obsolete.

But, for now, the pattern of broken promises on the part of PBX vendors has made users more skeptical about the capabilities of their products. Users have become more self-reliant, and they have learned to live in a multivendor environment that includes parallel networks for the voice and data communications requirements.

Users have made a significant financial investment in equipment to meet their needs, and they will not abandon that investment for new, untested technology aimed at simplifying an information-processing world that they have worked hard to make manageable.

Vendors must now offer products that solve users' applications needs, rather than dazzle them with talk of new generations. They must also prove their long-term viability, as well as their technological capabilities, to assure their customers that they will be around to support the equipment for as long as it is in place. Users should now recognize that they may find themselves on the bleeding edge of technology, rather than the leading edge, by taking risks on unproven products and suppliers.

Software's legal crossroads

BY J. REID HUNTER
Special to Network World

Since 1977, when Datapoint Corp. introduced its Attached Resource Computer line for interconnecting a complex of its minicomputers, the use of local-area networks and accompanying computer hardware and software has grown at an explosive rate.

The recent proliferation of local-area networks in the corporate environment raises new and complex legal issues for software vendors and users in the local net environment. Traditional multiuser systems comprised one or more processors in a box, which were under the control of one operating system. Accordingly, software licenses were designed around the concept of one CPU.

A local-area network consists of multiple processors connected to a medium, with each running under its own operating system and residing in its own box.

This presents unique licensing problems for software vendors and users. Further complicating matters are local-area network gateways, which extend the accessibility of network resources to a potentially unlimited number of users and locations.

Copyright coverage

Using applications software in a local-area network without express authorization from the software vendor constitutes copyright infringement under current copyright laws.

U.S. copyright laws protect any original work of authorship that is fixed in a tangible medium of expression.

In addition, the most recent version of the Copyright Act extends copyright protection to computer programs, which are considered to be intellectual property. The courts have interpreted this to include programs in machine-readable, or object code, form, the most common form in which software is sold.

The provisions of the Copyright Act give the owner of copyrighted software certain exclusive rights, including the right to reproduce his work in the form of copies, to distribute those copies, to prepare works based on the software and to display the work publicly. Exclusivity means that, in the absence of permission from the owner, any copying, distribution of copies, creation of derivative works or display of the work by another is an infringement of the owner's copyright and may be redressed by criminal penalties and by civil suit. The Act defines copies as "material objects . . . in which a work is fixed by any method . . . and from which the work can be perceived, reproduced or otherwise communicated, either directly or with the aid of a machine or device."

Furthermore, the fixation must be "sufficiently permanent or stable to permit it to be perceived, reproduced or otherwise communicated for a period of more than transitory duration."

Technically, inputting any computer program into the random-access memory (RAM) of any computer's CPU amounts to copying the software and would constitute infringement of the vendor's copyright.

However, recent additions to the Copyright Act allow the creation of a copy of a program within a computer, provided that such a copy "is created as an essential step in the utilization of a computer program in conjunction with a machine and that it is used in no other manner." But, if the computer into which the program is input is a component of a local-area network, access to the program by any other CPU on the network requires copying of the software in a manner that is outside the realm of the program input exception.

Both of the current methods of accessing applications software through a local net — remote logon or file-transfer procedures — involve some replication of the software in a second CPU.

Remote logon access to software is facilitated by a file server, a stand-alone minicomputer or microprocessor with an attached disk drive dedicated to the file serving and sharing functions.

This disk serves as a central local-area network repository for shared software. Other devices on the network must communicate with the file server in order to gain access to the software, and although the software contents can be viewed or altered, they are not permanently replicated.

At the conclusion of a remote logon access, only one original version of the accessed software remains.

By contrast, file-transfer access transfers all or a substantial part of the software from one processor's storage medium to another. At the conclusion of the file-transfer process, there may be multiple replications of the software on other network-attached processors.

Unauthorized software copying takes place in a local net when software is accessed by a second component utilizing either of these access modes. In the file-transfer context, all of the machine-readable software is copied into the second CPU exactly as it existed in the first CPU, and it remains within the second CPU in permanent and stable form.

In the remote logon context, at least some of the software is transmitted to the second CPU, replicated in RAM and displayed at the attached display terminal. The part of the software that is stored and displayed violates the copyright because it exists for more than a transitory duration on the terminal of the second CPU.

Such copying probably is not covered un-

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Hunter is an associate attorney at Hurt, Richardson, Garner, Todd and Cadenhead in Atlanta.

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JOHN KILROY

In the new world of the IBM Token-Ring network it's nice to see an old familiar face.

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der the act's program input exception, since it is not an essential step in using the program with one machine. Rather, it is an incidental step to the use of the program in conjunction with a number of machines. Furthermore, the stated intention of the exception was to make the inputting of a copy of a program into a computer noninfringing. Therefore, accessing applications software by a second CPU in a local-area network is copying and constitutes copyright infringement.

Moreover, unauthorized use of software in a local-area net arguably constitutes distribution of the software as well, which violates another exclusive right of the software vendor.

The electronic transmission of a program from one CPU to another — in both the file-transfer and remote logon contexts — may amount to distribution of the software since the effect of such transmission is identical to that of traditional, physical distribution of the software media.

Local net licensing

Case law has not yet addressed the question of software use on local-area networks. However, to avoid the risk of revocation of existing software licenses and criminal and civil penalties for infringement, local net users should secure permission from the vendor to use copyrighted software. Authorization can usually be obtained through payment of a reasonable surcharge that preserves the cost benefits of resource sharing.

In addition to the surcharge for local-area network licensing, there are license fees for traditional uses of the software or uses defined in site licenses that permit physical but not electronic copying and distribution of software. The two basic vendor pricing schemes for local net software licensing are fixed surcharges and measured-use surcharges.

The fixed surcharge is similar to a site license agreement, which permits a user to make and distribute an unlimited or large number of copies for use on the premises at a fixed fee. The fixed surcharge may either be a prepaid one-time fee or a recurring periodic charge, for example, monthly or annually. This scheme is based on the assumption that a relatively large number of copies will be made.

Measured-use pricing has two variations. The head-count approach measures the number of users on the local-area net by measuring the number of CPUs and terminals. The access count scheme measures the number of times during a specified period that applications software residing in the file server is accessed or transferred. The access count scheme is the more accurate measured use method, since it reflects actual use over time. It also obviates the need for the vendor to police the system, since the system monitors itself.

However, metered systems are simply too costly in terms of storage, performance and required hardware for use on increasingly less expensive microcomputers and their peripherals.

Presently, the more feasible and more popular measured-use technique is the head-count scheme, under which pricing is determined at the time of licensing. First, the vendor establishes a number of ranges of terminals or processors. The ranges are then coupled with a price, which is usually based upon a discounted multiple of the non-local net licensing fee. Users should negotiate with software vendors for pricing based on a measured-use, head-count pricing structure.

Under this agreement, the vendor relies on audit and policy rights in the license agreement and the threat of termination of the license to enforce the agreed-upon terminal and CPU limits.

Gateway provisions

The addition of a gateway to a local-area network adds a new dimension to issues of software protection and pricing. Gateways, which are the links through which local nets may be interconnected, can cause the range of potential users to be virtually unlimited.

Gateways may be local in nature, connecting one local net to another on the user's premises. Alternatively, long-haul gateways connect the network to public telephone or other telecommunications networks, and thereby, to the entire outside world. If software is accessed over a long-haul gateway, it becomes impossible for the vendor to monitor software use. For this reason, most local-area network licenses prohibit transmission of programs through long-haul gateways. However, agreements allowing the use of local gateways are usually negotiable on a fixed surcharge or measured access basis.

The bottom line

Although some software vendors have prohibitions against local net use in their standard licensing agreements, many do not mention network use at all.

In cases where the license agreement does not expressly permit local net use, access of the licensed software by network components is

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SPECIAL SECTION: LOCAL-AREA NETS

IBM's Token-Ring infiltrates the market

Users see the product as a long-term contender.

JOHN KILROY

BY GARY KWOK
Special to Network World

As the newest, biggest kid on the block, IBM's Token-Ring Network was expected to rise quickly to the head of its class.

Now, six months after its arrival, school is still in session, and the Token-Ring's first report card shows mixed marks. Whispers are heard about lower-than-expected performance, compatibility conflicts and availability problems.

But if the few companies that have struck up an initial acquaintance with the Token-Ring are any indication, IBM's latest network is a stayer.

Bank of America in San Francisco, one of the Token-Ring's early users, has run a 20-station network since May to evaluate wiring, optimal configurations, local-area network administrator software requirements and performance.

"We are evaluating the Token-Ring to see if it works as advertised," explains Mike Leonardich, a consulting system engineer in the bank's product evaluation group responsible for networks.

In the bank's effort to determine the Token-Ring's long-term viability and performance, the network is not being used as a pilot test site but as a production network. There are as many as 18 end users running office automation applications, such as Multimate International Corp.'s Advantage and Ashton-Tate's Dbase III Plus, on the network.

Other features include 3270 emulation, electronic mail to a VM host, file uploading and downloading and printing to a network printer.

In conducting performance stress tests on the network, the group's engineers say they have yet to hit the upper boundaries of the network's capacity.

According to Leonardich, "I'm pleased with the performance of the wire. The response times through the gateway have been adequate."

He adds that most users currently gain access to VM through dial-up or direct coaxial connections.

Using the Token-Ring Network, these users have had 2.5 second response times for full-screen replenishing, which he says compares quite favorably with a standard 3270 attached to a mainframe.

On the other hand, Leonardich suggests that "the network user interface can use a little assistance."

Specifically, he says that improvements can be made in ease of installation, friendly user documentation and beefed up password security.

Leonardich says he is also concerned about the size of programs. The personal computer local-area network program consumes from 128K bytes of random-access memory (RAM) for just the redirector, to 320K bytes or more for the server configuration.

The 3270 emulation software uses roughly 150K to 200K bytes of RAM, and Network Basic I/O System (Netbios) eats up about 75K bytes of RAM. Netbios on the Token-Ring must now run as a program either resident or loaded on the disk from the RAM rather than in read-only memory as with IBM's PC Network.

But Leonardich points out that this is only Release 1.0 of the software, and he says he is confident that improvements in both user interface and memory requirements will be forthcoming.

Another early user of the Token-Ring Network, The United Way of the Bay Area, installed a six-node Token-Ring Network with Novell, Inc.'s Advanced Netware 2.0A and 286B file server.

The network is being used to automate the agency's telemarketing fund-raising efforts, including managing more than 17,000 potential contributors, sales management queries, efficiency analysis reports, letter generation and scheduling.

Although there was some initial difficulty in locating an adequate supply of adapter cards, Jack Healy, United Way's associate executive director, says he is satisfied with the network.

"The computer system is doing everything we wanted it to do when we talked about what our application need was," he says.

Healy adds that it gives quick access to data even when all the users are on the network at the same time.

The United Way chose the Token-Ring over Ethernet so the organization could eventually tie into its IBM System/36 minicomputer. If the network proves successful at this location, Healy hinted that there would be a good chance of duplicating the Bay Area's network setup at other United Way locations across the country.

Most other local-area network vendors agree that although IBM's new local-area network has not set any speed records, it is nevertheless meeting user expectations. Bob Oakley, Nestar Systems, Inc.'s director of

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Kwok is director of marketing for Network Strategies Group in San Jose, Calif.

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marketing, suggests that complaints by some users that the Token-Ring is slow may be related to network software that "takes more time to set up and run."

According to Oakley, during network boot, the adapter card runs more self-diagnostics than other networks, which might account for the "slowness" complaints.

3Com Corp., a local-area network vendor that has introduced a Token-Ring-compatible board of its own, says it has found no significant difference between the performance of its 3+ Ethernet cards and its new 3+ Token-Ring cards.

According to Bridget McNiel, 3Com's product manager for Token-Ring products, "although our tests on 3-, 6- and 9-node networks showed that Ethernet was faster by about 25%, this probably isn't enough to make your network decision on."

While IBM has positioned the Token-Ring as a "high-performance network" with a 4M bit/sec data rate, experienced network users understand that this theoretical data rate has little to do with actual network performance.

"The criticism I've heard has been related to the PC Network software," says 3Com's McNiel. "If you didn't like PC Network software, you won't like Token-Ring software."

Charles Hanes, director of technical consulting at Network Strategies Group, offers a comparison between Token-Ring software and Netware during user logon. Hanes explains that to start up the IBM network, users must key in strings of cryptic commands to gain access to a specific volume on a server.

By contrast, Netware enables the network administrator to predefine volume access keyed to user logon names. Although IBM also offers an optional interactive interface to the network program, Hanes points out that it merely provides a menu-type interface that still requires users to understand and specify server names and volume letters.

Minor glitches

As expected with a new product, the Token-Ring network has not been bugfree. In addition to the initial shortage of adapter cards, there have been incompatibility problems with some applications software and peripheral products. In August, reports of compatibility problems between Dbase III Plus and Token-Ring Network surfaced, although Ashton-Tate has never officially stated that it supports the Token-Ring Network.

Because the Token-Ring supports Netbios, software written for IBM's earlier Personal Computer Network should also run on the Token-Ring — unless the software bypasses the Netbios. Users cannot assume that just because a product supports the PC Network, it will also support the Token-Ring Network.

Also in August, a separate compatibility problem surfaced when Digital Communications Associates, Inc. (DCA) users detected incompatibility between the firm's popular Irma 3270 emulation board and the Token-Ring. When both cards are installed in the same PC, apparently one of the cards will not function. DCA is currently modifying its boards in an effort to resolve the problem. Should these two cases be viewed as red flags, cautioning users to wait a while longer before jumping on the Token-Ring bandwagon?

When it was announced in October 1985, the Token-Ring Network drew the immediate attention of traditional IBM mainframe customers, other large users and competing local-area network vendors.

It was certainly not because of its 4M bit/sec data transfer rate; Ethernet was already touting 10M bit/sec. And it was not because of its token-passing technology; Datapoint Corp.'s Arcnet had a token-passing access method years ago.

Would the new network offer a revolutionary network operating system with improved security and higher performance? Not likely, since IBM decided to retain MS-DOS 3.1 — now DOS 3.2, which is 3.1 with some minor improvements — a carryover from its less-than-impressive broadband network, the PC Network.

As a local-area network, the Token-Ring brings with it no revolutionary new technology. Yet it has been viewed as a milestone in the networking industry and a strategic IBM product for the following major reasons:

Multivendor Connectivity. IBM has positioned the Token-Ring as the overall backbone for connecting various local-area networks using bridges and gateways. Already announced but not yet available are connections between System/36s, Personal Computers and large mainframes such as the 3080 and 3090.

IBM has made possible the integration of incompatible data equipment via the Token-Ring by making public the Token-Ring specifications. Information is now available for third-party vendors to build interfaces to the Token-Ring.

This is significant for large corporate clients whose MIS structure is typified by complex multivendor environments. It means that IBM no longer claims to provide the complete solution for all applications.

On the other hand, by offering a network that will eventually connect a variety of systems and devices, IBM can now enter shops that are non-IBM.

Standards and Open Architecture. By publishing the Token-Ring specifications, IBM was able to gain an important stamp of approval in the form of the IEEE 802.5 Token-Ring specification.

By making available a nonproprietary open architecture, IBM was able to rally major independent local-area network vendors around the Token-Ring, gaining widespread acceptance of its network.

3Com, which helped to establish Ethernet as one of the leading network technologies, was one of the first local-area network vendors to acknowledge the Token-Ring standard, shipping its first Token-Ring boards in July.

Optional cable media. By offering five different types of media, IBM provides users with increased flexibility in their wiring options, from standard Type 1 data-grade wiring or telephone twisted-pair to state-of-the-art fiber optics.

McNiel notes that "the real thing people have latched onto is that the network will run on their existing telephone wire."

The promise of LU 6.2. Perhaps the greatest significance of the Token-Ring lies in its potential to offer peer-to-peer communications through LU 6.2.

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Debunking data rate delusions

It is a misconception that a network's performance is primarily determined by the rate at which data travels across its bus.

If this were the case, the 10M bit/sec Ethernet network would be 2½ times as fast as the Token-Ring Network, and the Token-Ring would be twice as fast as the IBM PC Network. Although a network's theoretical data rate or bandwidth is a factor in determining network performance, it certainly is not a major criterion.

Other factors that play a much larger role in network performance are file server mechanical disk access, the network's operating system, file access efficiency, file-disk server buffers, packet size, access method, network cards and applications software. Only then does the network data rate come into play.

Mechanical disk access. The real bottleneck in network speed is the shared hard disk or disks. Platter rotation speed, actuator and coil design, data transfer rate and power all affect access time.

To illustrate this point, the first personal computer drives had average access times of 75 msec. Today, these times are down to 25 msec to 30 msec.

Operating system. A network's operating system can greatly accelerate performance by limiting disk I/O through caching or buffering. Although this technique has been used for years in mainframe disk controllers, Novell, Inc. was one of the first to apply the technique to local-area networks.

Mike Paluzzi, a systems engineer for one of Novell's new Netware Centers, responds, "The software is the real issue in performance. It's not the size of the tube, but what you do with the tube."

File server. In conjunction with the operating system is the file server. It may be a proprietary server, such as those from Novell, Banyan Systems, Inc., Nestar Systems, Inc. and 3Com Corp., or it might be a generic server, like an IBM Personal Computer XT or AT.

In testing Ethernet vs. Token-Ring, 3Com, a local network maker in Mountain View, Calif., reports that in terms of data rate, the difference between the two was insignificant.

However, when the server was changed from a 6Mhz to an 8Mhz processor, the acceleration of the processor's data rate was immediately apparent.

Packet size. Data is moved across the network in packets. Logically, the actual size of the packet will determine how long it will take to move data across the network.

Access method. The two major access methods in the personal computer local-area net market are token passing, supported by the IBM Token-Ring and Arcnet, and carrier-sense multiple access with collision detection (CSMA/CD), supported by 3Com's Ethernet, Corvus Systems, Inc.'s Omninet and others.

In general, CSMA/CD networks can transfer data across the network faster than token-passing networks in situations where there is light network traffic.

However, when there is a lot of traffic on the network, token-passing networks show less performance degradation.

The analogy would be an eight-lane highway with a 100 mph speed limit on the outskirts of a major metropolitan area.

Once you get onto the CSMA/CD highway, you can really move. However, it won't do you any good if you can't get out of the rush-hour traffic.

Network cards. The random-access memory for data buffering on the network card determines how fast information can move from the workstation onto the network.

In addition to the buffers on the card, the cycle rate of the bus and circuitry speed are also important.

Applications software. Applications software can also play a role in network speed.

Does the application take advantage of methods to optimize performance on the network, such as limiting disk access? Applications written specifically for networks will often do this.

— Gary Kwok

▶ IBM TOKEN-RING

Big Blue holes

Ken Santoro, Banyan Systems, Inc.'s Western district manager, offers a critical view of IBM's Token-Ring Network strategy.

"IBM has used the Token-Ring as a means to tie PCs to mainframes as they used Systems Network Architecture to tie 3270s to the mainframe."

He points out that all product announcements have been aimed at terminal-to-host connectivity, never mentioning servers and naming conventions.

He singles out what he considers an important deficiency in the PC LAN personal computer local network operating system for the Token-Ring: the lack of a global naming convention, which, he explains, is the network equivalent of directory assistance.

Without it, users cannot browse through the system but must know the specific names of other users, servers and peripherals.

"And when a user moves, that user's log-in diskette must be modified, creating an administrative nightmare," Santoro claims.

Software that offers global naming conventions, such as Banyan's Virtual Networking System, frees the network system from tying every file volume to a specific server, providing location independence.

Enhancements not expected

Santoro says he doesn't think IBM will come out with a lot of enhancements to personal computer local net software.

"The operating system doesn't give you E-mail or access to wide-area networks. It doesn't give you the tools to turn your local net into a corporate distributed system," he says.

According to Santoro, it is in IBM's best interest to keep the Token-Ring operating system at a medium performance level, thus assuring itself of more mainframe sales, where margins are healthier.

Bob Oakley, Nestar Systems Inc.'s director of marketing, agrees that IBM has left several holes within its network.

Specifically, he notes the "lack of a dedicated file server, providing an opportunity for third-party suppliers like Nestar — which elected to resell IBM Token-Ring boards instead of produce its own — to develop powerful servers to fill the hole."

He suggests that IBM's decision not to release a dedicated file server was not an oversight on IBM's part.

It was, he concludes, a strategic decision in light of its commitment to its System/36 and System/38 minicomputer lines.

— *Gary Kwok*

From **page 50**

IBM's LU 6.2 and Advanced Program-to-Program Communications/PC protocols allow nodes attached to the same system to communicate with each other directly. This means that PCs can talk to other PCs anywhere on the network or on connected networks through gateways. It also means that PCs can talk to hosts and hosts can talk to hosts directly.

The Token-Ring Network, as the first commercial medium on which LU 6.2 will be implemented, is one of the key ingredients in IBM's peer-to-peer communications recipe. Without LU 6.2, the Token-Ring would be just another PC local net with slightly less expensive wiring.

Will this actually happen? The Bank of America seems to think so. Its Retail Banking division is looking at the LU 6.2 and Token-Ring combination as a vehicle for simplifying communications between more than 15 mainframes and hundreds of automated teller machines (ATM) throughout California.

The bank's current method of handling ATM transactions requires individual connections between the mainframe communications controllers and each multidrop ATM communications link.

LU 6.2's ability to support many conversations occurring over the same data link session has led the bank to consider consolidating all these transactions into a single logical connection between the mainframes and ATMs. Jim Overby, chief consultant for retail banking, refers to this as "copper consolidation" and explains that "LU 6.2 allows logical multiplexing of the application and transaction traffic of a branch to the back-end servers."

The benefits of this strategy are twofold. According to Overby, "LU 6.2 has dramatically facilitated our consolidation effort by allowing direct program-to-program commands." It reduces the overhead that would normally be needed on both ends of the conversation, for example, 3270 emulation. It reduces the need for mainframe processing by using PCs out front on the Token-Ring to build the logical transactions.

Continued on **page 52**

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From **page 51**

Overby says he also likes the technical characteristics of the token-passing access method. He explains that with a collision-detection scheme such as that used by Ethernet, an unlucky node could collide indefinitely and never reach its destination across the network. Although this scenario is unlikely, any possibility of its occurence makes this type of access method unacceptable in certain financial applications such as the bank's.

On collision-detection systems such as Ethernet, he observes, the collisions create so much overhead that the real bandwidth drops from a maximum theoretical 10M or 12M bit/sec to about 4M bit/sec.

Brad Baldwin, local-area network industry analyst for Dataquest, Inc., says that although he thinks the Token-Ring and Ethernet can both exist in the market, the one thing that users can count on with a token-passing access method is that access speed will always be consistent because all nodes are guaranteed an equal share of the token.

Somewhat related to guaranteed access is the automatic protection mechanism in the concentrator or multistation access unit (MAU), the central hub for connecting PCs on the Token-Ring.

A problem on any individual link on the ring will not affect the operation of the entire network. If a problem occurs, the MAU will detect the source and route the token around the problem node. In the case of the bank, if there is a problem such as a fire in one of the branches, none of the other branches will be affected.

A nonproprietary system

Overby notes a further advantage of the Token-Ring. By considering a nonproprietary system, the bank will not lock itself into one vendor. He states that "a lot of people such as 3Com and Novell are building compatible products that give us multiple vendor choices."

The Token-Ring, IBM's third network in three years, is not in itself a revolutionary network in terms of performance and functionality. Yet with its open architecture and mixed-vendor connectivity capabilities coupled with the flexibility of its various wiring schemes and the guaranteed access offered by its token-passing access method, the Token-Ring will be widely accepted.

Further, as a strategic product for IBM and with the potential advantages that it could offer through LU 6.2, the Token-Ring Network will evolve into a long-term contender in the marketplace.

In its first six months, the Token-Ring Network has been a relatively quiet product. But let's not forget another quiet starter from IBM: the Personal Computer.◘

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Integration from **page 39**

and communications products and services. On the other hand, no manager wants to deal with hundreds, or even thousands, of niche suppliers.

Full-service suppliers offer several economies. Building a relationship with a vendor takes time and effort, and it makes sense to spread that effort over a broad spectrum of products. These vendors also have a broader view of a user's needs. They have more options to offer and are less likely to force fit an unsuitable product into the wrong circumstance.

Also, a customer who buys several products from one vendor usually has more leverage with the salesperson and the vendor. Occasionally, that translates into dollar savings, but more often, it means better service, more attention to complaints and greater responsiveness. The need for a full-service approach is also apparent in consulting. Many clients are looking for one company that can address all their technology issues as well as all the business, financial and management issues that are affected by technology.

Many users are developing relationships with consulting firms that can assist in a wide range of networking, communications and information technology areas.

The consultant may conduct a "soup-to-nuts" study on one occasion and only provide casual advice on another.

In years gone by, technical expertise was enough; today, technical expertise must be complemented with industry knowledge, financial acumen and business experience.

But despite this trend toward increasing use of full-service vendors, communications managers will continue to deal with a wide variety of vendors of every size, shape and description.

Large companies will provide fundamental network components and the framework in which the products of secondary vendors can be considered. Specialty vendors will provide technically advanced products, which fill more exotic needs that cannot easily be met elsewhere. On the other hand, low-cost producers will be able to provide commodity products at the best possible prices. A proper balance among specialty product companies, low-price manufacturers and full-service vendors will produce the best results.◘

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1 **My primary areas of activity.** Circle ONE only.

I am involved in evaluating communications (data, voice and /or image) products and services:

1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both

a **For communications, my primary responsibility is:** Circle ONE only.

1. Data Communications
2. Voice Communications
3. Both

2 **Circle only the ONE title classification which most applies to you.**

Company Management

11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CIO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications

21. Management
    VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff
    Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications

31. Management
    VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks, Engineering, Design, R&D, Application Development
32. Supervisory/Staff
    Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications

41. Management
42. Supervisory/Staff

MIS/Data Processing

51. Management
    VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of System Design, Analysis, Applications

Others

75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other ________________

3 Job Function

Which one of the following best describes your functional involvement with communications (data, voice, and/or video) products? Circle ONE only.

Corporate

1. Business Management, Planning and/or Development

Communications System/Network

2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other ________________

4 **Which one of the following best describes the primary business activity of your organization at this location?** Circle ONE only.

Consultants

11. DP/Communications Consulting Services
12. Consulting Services (except DP/Communications)

End Users

13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/Construction/Petroleum Refining/Agriculture/Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors

41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, Intern'l Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other ________________

5 **In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services?** Circle ALL that apply.

1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 **Check ALL that apply in columns A and B.**

A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:

B. These products and services are presently in use at this location:

	A	B	*Product/Services*
			Computers
01.	☐	☐	Micros
02.	☐	☐	Minis
03.	☐	☐	Mainframes
			Data Communications
04.	☐	☐	Communications Processors
05.	☐	☐	Comm./Networks Software
06.	☐	☐	Digital Switching Equipment
07.	☐	☐	Facsimile
08.	☐	☐	Modems
09.	☐	☐	Multiplexers
10.	☐	☐	Protocol Converters
11.	☐	☐	Network Mgmt. & Control
12.	☐	☐	Test Equipment
13.	☐	☐	3270 Controllers
			Telecommunications
14.	☐	☐	PBXs
15.	☐	☐	Key Systems
16.	☐	☐	Central Office Equipment
17.	☐	☐	Integrated Voice/Data Terminals

	A	B	*Product/Services*
			Transmission/Network Services Equipment
18.	☐	☐	Microwave
19.	☐	☐	Satellite Earth Stations
20.	☐	☐	Local Area Networks
21.	☐	☐	Wide Area Networks
22.	☐	☐	Packet Switching Equipment
23.	☐	☐	Fiber Optic Equipment
			Communications Services
24.	☐	☐	Packet Switching Services
25.	☐	☐	Cellular Mobile Radio Services
26.	☐	☐	Electronic Mail
27.	☐	☐	Enhanced Services
28.	☐	☐	Centrex

7 **Estimated value of communications systems, equipment and services:**

A. which you helped specify, recommend or approve in *last* 12 months? Check only ONE in column A.

B. which you plan to specify, recommend or approve in *next* 12 months? Check only ONE in column B.

	A	B	
1.	☐	☐	Over 10 million
2.	☐	☐	$5-10 million
3.	☐	☐	$1-5 million
4.	☐	☐	$500,000-1 million
5.	☐	☐	$250,000-500,000
6.	☐	☐	$100,000-250,000
7.	☐	☐	$50,000-100,000
8.	☐	☐	Under 50,000
9.	☐	☐	Don't know

8 **Estimated gross annual revenues for your entire company/institution:**

Circle only ONE.

1. Over $1 billion
2. $100 million to $1 billion
3. $5 million to $100 million
4. Under $5 million

9 **Estimated number of total employees at this location:**

Circle only ONE.

1. Over 5,000
2. 1,000-4,999
3. 500-999
4. 250-499
5. 100-249
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- **FIELD SERVICE REPS:** Install PDI Products; Use test equip/datascopes for protocol ID/trbleshtng; Track instltns thru modem lnks; Render first line response to end user trouble requests via phone. REQ: 2 yrs exp servicing/installing packet switching eqpmnt. Extensive travel. **NYC. SAL: $18-20's K.**
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- **SALES REPS:** Sale of X.25 Sync PADS & related Data Comm prods; proposal wrtng; REQ: 2 yrs proven track record with Packet Switching Equipment Sales; Some travel. **NYC. COMP: $30's K + Comm, Expenses, Stock Options.**
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Regulation from **page 4**
submit ONA plans to the FCC by February 1988.

In the time since these terms first entered the vocabulary, users, vendors and service suppliers have been trying to figure out how each term relates to current and planned services. The FCC has drawn up the basic guidelines and has asked technical experts from the communications industry to help fill in some of the gray areas.

At last week's conference, David Rendall, president of Teletrends of Raleigh, N.C., said ONA represents a new playing field and CEI the new rules of the game.

"The basic forces that brought these changes about happened a long time ago with the 1956 Consent Decree," Rendall stated. "The New York District Court ruled that the integrated communications giant AT&T could not enter the data processing business." The court thought it was protecting the fledgling computer industry, he added.

"Technology says you can combine communications and data processing. The law said you couldn't. The problem is that technology can't obey the law. Technology has no respect for the law or its enforcers," Rendall said.

Regulators who sought to separate computing and communications now realize the confusion and disincentives brought about by those restrictions. Since divestiture, regulators have been trying to facilitate the natural convergence of computers and communications while protecting competition. CEI is an attempt to give all players equal advantage to compete in this converging market.

"ONA represents a profound rebirth of the public network. It will support rapid introduction of new services, encourage non-BOC vendors to participate and stimulate network usage," Rendall said.

AT&T does not like the ONA concept because it will hurt the company's ability to compete and eliminate its incentive to innovate, according to Frank Ianna, director of marketing strategy planning at AT&T. "AT&T does not possess bottleneck facilities like the BOCs do and is not a major player in the enhanced service market," he said. "ONA would require AT&T to make its proprietary data bases available to its competitors and force it to prematurely disclose business plans. That would cause us to lose the opportunity we targeted."

AT&T maintains it is already providing open network features to meet market demands and has asked the FCC to reconsider its ONA order. The BOCs are taking a more enthusiastic approach to CEI and ONA, and are already planning new services in accordance with the regulatory guidelines. ◪

CMA from **page 1**
cal background and, for the most part, dealt with a single vendor who installed and serviced all telecommunications equipment.

The breakup of AT&T, however, changed all that. No longer does the manager need just a technical background. He or she now needs business savvy, members say.

"Divestiture has made senior management very aware of telecommunications," said Bill Brown, coordinator of telecommunications financial services at the information systems division of Eastman Kodak's Rochester, N.Y., headquarters.

Sobers added, "We find ourselves having to do more in-house than we had to do before." As many departments find themselves increasingly involved in day-to-day maintenance, the communications manager must hire enough people to staff the equivalent of a little telephone company. But managers are finding it difficult to find qualified people, Sobers said.

Divestiture has increased the number of workers in the telecommunications industry, but most have little or no direct experience in the maintenance of telecommunications equipment, said Chuck Schweis, a senior telecommunications consultant at the U.S. headquarters of the international chemical firm Ciba-Geigy in Ardsley, N.Y.

"They're just coming out of school or they just happen to overflow into the telecommunications side from the DP side," he added.

The long-time rift between telecommunications departments and data processing departments may be closing, but the telecommunications manager must learn management skills to survive and grow into new positions, CWA members say. A growing number of companies are creating the position of chief information officer, who oversees the directors of data and voice operations reporting.

"There's got to be a marriage of data and voice operations. I don't see it any other way," said Tony Mattera, the manager of electronic data interchange at Champion International Corp., a Stamford, Conn.-based paper company.

Managers contacted by *Network World* also said they want to learn more at the conference about T-1 networks, which they said will fill in for Integrated Services Digital Network-type offerings if they are not available soon. ◪

Legal crossroads from **page 48**
beyond the scope of the license and is an infringement of the vendor's copyright. Until express authorization is obtained, continued local-area network use is a basis for termination of the license and for a copyright infringement suit against the user.

Moreover, as local-area net use becomes commonplace, software vendors can be expected to begin challenging unauthorized local net use to prevent losing control of their intellectual property. Such litigation can be costly; the Copyright Act provides for statutory damages of $250 to $10,000 or more per infringement or actual damages, such as a vendor's lost revenue.

In addition, the cost of defending a corporation against such a suit could easily run into many thousands of dollars. Finally, it's not clear whether unauthorized local-area network use constitutes one infringement or many infringements. As a result, the amount of damages awarded could be large.

By paying software vendors a reasonable surcharge for local-area net use, users can head off a possible confrontation while preserving the cost savings resulting from local net resource sharing. ◪

Sun from **page 2**
cols," said Donna Horton, product manager.

"We can have the same machines running TCP/IP, Rlogin, and Network File System (NFS)."

Rlogin is a Unix command for initiating a virtual terminal session, and NFS is a heterogeneous file system developed by Sun.

> *"MAP support has been added to Sunlink OSI, a package supporting the ISO's Open Systems Interconnect model."*

Support of MAP has been added to Sunlink OSI, a networking package that supports the protocols of the International Standards Organization's Open Systems Interconnect model.

This package previously supported only TOP.

Sunlink OSI now supports such MAP applications as MAP Communication Application Service Elements, Network Management and Directory Services, as well as Sun's NFS.

MAP 802.4 controllers, available from third-party vendors, can be used to link Sun workstations to MAP networks.

Sunlink OSI is available for $3,000 for both TOP and MAP networks; it may also be purchased for $2,500 for TOP only.

Sun is offering two products for connecting its workstations to DEC systems.

The Sunlink DNA-Type Protocols allow Sun users to access a Decnet, while the Sunlink VT100-Type Terminal Emulator provides an asynchronous connection.

Sunlink DNA supports standard Decnet functions, including bidirectional file transfer, and is priced at $1,200.

Sunlink VT100 allows users to access DEC systems through a window on the SUN emulating a VT100 terminal. It is priced at $500.

Sunlink DDN allows Sun workstations to act as nodes on the range of packet-switched DDN, including Milnet, and the Advanced Research Project Agency Network, used by the Department of Defense's Darpa.

It is priced at $4,000.

Sun has added support for X.3 and X.29 to its Sunlink X.25 product, allowing Sun users to communicate with non-Sun, non-TCP/IP host systems — and vice versa — on a public data network.

Sunlink X.25 is $2,500. Shipments of all the new products will begin in November. ◪

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Comsat from **page 1**

The merger, which would improve Comsat's financial health, must be approved by the Federal Communications Commission. Alan Pearce, president of Bethesda, Md.-based Information Age Economics and former chief economist of the FCC, said the FCC will speedily bless the corporate marriage.

However, William G. McGowan, chairman and chief executive officer (CEO) of MCI Communications Corp. and the man credited with ending the AT&T monopoly, said his company intends to challenge the deal on anticompetitive grounds.

Under the proposed management structure, the current chairman of Contel, Charles Wohlstetter, will become chairman of Comsat. John Lemaster, president and CEO of Contel, will become president and CEO. Comsat's current chairman and CEO, Irving Goldstein, would become vice-chairman.

Marcel Joseph, now president and CEO of Comsat, will be president and chief operating officer (COO) of all nonregulated activities, excluding operations serving the federal government. Donald Weber will remain in his position as president and COO of Contel's regulated telephone business.

Contel, based here, operates in both regulated and unregulated communications markets. Of the company's four major business sectors, its local telephone operations, serving 2.3 million customers, are by far the largest revenue generator. Additionally, Contel contains an Information Systems Division, which sells large private branch exchanges and networks to the Fortune 1,000; a Business Systems Division, which markets PBXs and key systems to small and mid-sized customers; and a Federal Systems sector, supplying government customers with very large PBXs and nets. Contel boasts 1985 revenue of $2.6 billion, with net income of nearly $240 million.

Comsat, located in Washington, D.C., was created in 1962 as the U.S. signatory to the International Telecommunications Satellite Organization and International Maritime Satellite Organization. The company has approximately 25% ownership in each consortium.

Most of Comsat's revenue is generated through its role as a carrier's carrier — leasing satellite transponder space to AT&T, MCI and the like. In its other, unregulated line of business, the sale of private satellite networks for voice, data and video communications, Comsat competes with companies that are among its largest customers.

The unregulated systems sales side of the business operates at arm's length from the regulated transponder-leasing side. Despite this precaution, the relationship between the two has remained a bone of contention with regulated competitors.

In the six months that ended June 30, 1986, Comsat reported earnings of $53.3 million on revenue of $236.1 million. The company has run into bad luck in some ventures, notably with its interest in Satellite Business Systems (SBS). In conjunction with Aetna Insurance Co., Inc. and IBM, Comsat launched SBS to a disinterested market and sustained heavy losses before withdrawing in December 1984.

That failure, combined with the growing threat to satellite transmission services posed by fiber optics, put Comsat in need of financial help, analysts said.

But Richard Tallman, senior industry analyst with Dataquest, Inc., a market research company in San Jose, Calif., said he thinks the perceived danger to the satellite business is exaggerated. "The FCC has taken a strong stance on protecting the balance between cable and fiber in international communications," he said. "Intelsat traffic won't dissipate. It's a continuously growing market."

Currently, FCC regulations require that carriers use satellite communications for 48% of total international traffic. This practice is referred to as balanced loading.

There is no dispute over Contel's general health. "The company has enormous financial strength," Mayfield said.

Siemens from **page 6**

companies. GTE will continue to market its GTD systems in the U.S. on its own. The companies decided to market separately after evaluating the feasibility of integrating the EWSD and GTD lines.

Siemens Data Switching Systems, formerly Siemens Databit, will continue to operate as usual. The division sells private packet-switching systems to businesses and to the divested BOCs.

The company also released details concerning 14 new products to be introduced through 1987. The products were developed by former GTE Transmission Products Division. According to Jeanne Elliott, manager of external communications at Siemens Transmission Systems, the products will include 12 high-speed, fiber-optic devices, specifically repeaters, terminals and multiplexers, all of which will fall under common control.

Satellite from **page 6**

the island's leased-line connection to the mainland processing facility.

Communications were restored after an Equatorial Communications Co. Vsat was installed on the roof of the airline terminal. The Vsat transmitted information via satellite to Equatorial's master earth station in Mountain View, Calif., which communicated via leased line to Atlanta.

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TFM from **page 1**

ment. The program is intended to capitalize on pending tax law revisions and prey on the confusion created by the AT&T divestiture by packaging services in a manner reminiscent of the old Bell System. EDS is one of a handful of companies currently involved with Northern Telecom's TFM program.

“TFM will provide customers with a single source, which was the traditional appeal of local telephone companies,” said Geoffrey Tritsch, a principal of Powers Tritsch & Associates, Inc., a consulting firm in Wellesley Hills, Mass.

“Now there is an outside company saying, ‘We're going to be your telephone company. You pay us a monthly fee, and we'll guarantee dial tone to every desk that has a telephone.’ ”

Northern Telecom has talked to many local telephone companies about becoming TFM providers. EDS, Planning Research Corp. of McLean, Va., and Phoenix Concept of Pasadena, Calif., are three of the first companies to adopt the strategy, according to John Powers, Tritsch's partner.

“We don't think people will stop wanting to buy equipment,” said Warren Sanders, Northern Telecom's director of new business programs. “But we think there will be a major segment that wants to rent or acquire services rather than hardware.”

Removal of the investment tax credit as proposed in the tax bill now before Congress will spur interest in TFM, Sanders said.

“When clients make capital equipment acquisitions through cash or lease financing today, they take a 10% tax credit,” he explained.

“If they spent $1 million or assumed a debt obligation for that much they could apply a $100,000 credit toward their taxes.”

Corporate investment policies geared to achieve tax credits will have to be rethought under the new bill. “Some companies have an appetite for capital debt and others don't,” Sanders said. “For those that don't, TFM will give them the features, functions and services they need while relying on operating funds instead of capital funds.”

Whether bought outright or leased, switch acquisition today typically involves a down payment of 10% to 20% of the total system price.

“Many companies don't want their capital tied up in phones,” said Ian Angus, president of Angus TeleManagement Group, Inc., a consulting firm in Toronto. TFM services require little or no money down and no termination costs.

“If telephones aren't your main business, why would you want to run a phone company?” Angus asks. “As it turns out, there are reasons why you might want to, but many budgets are being squeezed, and even if you wanted to, it is hard to find and hire the staff needed.”

Powers believes the new tax bill will encourage corporations to reserve capital investments for items that serve their line of business and use operating funds for telecommunications services.

Sanders agrees. “Some companies are saying they will only put capital into things that produce revenue.”

Centrex customers make ideal candidates for TFM services. The very fact that users have Centrex indicates a desire to leave the management responsibility and headaches of switch ownership to someone else. Also, the cost structure of TFM would be similar to Centrex. “Centrex users think in terms of monthly recurring costs,” Powers said. “They don't think of procurement in a capital purchase way.”

TFM, Powers and Tritsch contend, presents a threat to local telephone companies because of the Centrex-like appeal. One or two large Centrex users may represent 80% of the traffic on a local telephone company's central office switch. Any time a user leaves Centrex for a premises-based alternative, TFM or other, the telephone company's investment in the abandoned central office is stranded, Powers said.

Sanders would not identify who the company was working with but admitted that service has begun with several accounts.

Fiber from **page 2**

building's 42 floors, bringing fiber cabling right to desktops. Approximately 2,000 asynchronous and 2,000 synchronous devices are connected over the fiber network, Stein said.

Stein said one major advantage of fiber is that the company doesn't need to recable if it moves or changes computer equipment: “All we have to do is change the electronics at the end of the fiber,” he said. “We feel we're set no matter what new technology comes, because we have the bandwidth. I wouldn't fool with coaxial. Fiber is easy to expand and it's easy to troubleshoot. It's a cleaner solution.”

As a telephone company, Southwestern Bell is probably more comfortable with fiber-optic cable than many other companies might be. However, bringing up the network — planning for which began in February 1984, with implementation completed in February 1986 — was not without problems. “We had a heck of a time finding interface devices for the IBM System/36 and Wang [Laboratories, Inc.] systems, but now those are available,” Stein said.

Indeed, an amazing range of networking vendors have jumped on the fiber bandwagon in the last six months. Early this summer, Codenoll Technology Corp. of Yonkers, N.Y., introduced a $995 fiber-optic version of 3Com Corp.'s Ethernet network card and announced an agreement with Sytek Inc. to jointly develop fiber products. The first fruit of that partnership was a $1,195 adapter card that turns an IBM Personal Computer Network or Token-Ring Network into a 10M bit/sec fiber-optic network. The adapter supports IBM's Network Basic I/O System (Netbios), so it is compatible with all software written for the IBM networks.

Codenoll also has an engineering, marketing and manufacturing agreement with Computrol Corp., a division of Kidde Automated Systems. To date, the joint effort has produced a fiber-optic modem compatible with IEEE 802.4 and Manufacturing Automation Protocol standards.

Fox Research, Inc. joined the fiber products pack last month. The Dayton, Ohio, developers of 10-Net — a baseband, bus network — introduced a repeater that allows users to connect individual 10-Net networks to others via fiber-optic cable. As many as four repeaters can be used to connect two networks up to 10,000 feet apart.

Currently, a slight modification must be made to Fox's network interface cards to support a fiber connection, but a new board that supports both fiber and twisted-pair wiring is now being beta tested, said Ed Schulz, engineering manager. The company is also working on a method to connect personal computers with fiber in a star configuration. Fox is hoping to have the system in production by the first quarter of 1987, he said.

Schulz and Codenoll Executive Vice-President Earnest Raasch agreed that one of fiber's main advantages is its immunity to electrical interference. As local-area networks grow larger, Raasch said, users with Ethernet networks are encountering noise problems. “For the very first time, thin Ethernet has to go through a wall or a ceiling, it has to go near power lines. Any induction motor plays havoc with data moving through thin Ethernet,” according to Raasch. Because of its error-correcting scheme, an Ethernet network calls for the retransmission of data every time it encounters a glitch, Raasch said. This concerted effort at retransmission can lead to terrible response times for users, or even system lockup.

“As more local-area networks become interconnected, the ticking bomb aspect of copper has begun to be realized,” Raasch said.

Despite its advantages, fiber's popularity is directly tied to its ease of use and dropping costs, say vendors and users. The availability of preconnectorized fiber-optic cable about a year ago was a major advance in making installation easier, Raasch noted. In addition, the price of a fiber connection for a local network was nearly twice that of an Ethernet connection in 1983; today they're almost on par.

Zapmail from **page 2**

delivery by courier. Federal Express had hoped to reduce the need for couriers by leasing the Zapmailer facsimile machines to users.

The Zapmail service, which the company hoped would become as popular as its overnight mail service, cost the carrier $25 million in operating losses in 1984, $122 million in 1985, $132 million in 1986 and $38 million for the first quarter of the current fiscal year.

Frederick Smith, chief executive officer (CEO) for Federal Express, said at the company's recent annual shareholders' meeting, “As we reviewed our plans for continuing Zapmail service, it became evident that our company would be subject to several years of substantial losses and the project would require several hundred million dollars more investment in customer premises equipment and network capital.”

Smith claimed the company hopes to offer a digital transmission service using small earth stations. “Unlike the Zapmail facsimile project, however, we do not plan to put the network out in advance of demand or on a speculative projection of traffic,” the CEO cautioned.

Kenneth Bosomworth, president of Norwalk, Conn.-based International Resource Development, Inc. (IRD), a market research and consulting firm, said the network was not designed to carry the amount of facsimile traffic needed for Federal Express to make the service profitable.

“Much of the blame for the failure of the service can be laid at the door of those who designed the software for the network nodes,” he claimed. “The software in the nodes that handled the packetization and buffering of information was slow. This problem created throughput limitations which greatly restricted the amount of traffic the network could handle,” Bosomworth contended.

The Zapmail service was originally to be offered via satellite. The nodal X.25 net was designed as an interim solution while Federal Express finalized its plans to launch a communications satellite. A series of satellite launch vehicle problems, beginning with the explosion of the Space Shuttle Challenger in January, served to delay the company's launch plans.

Once Zapnet was fully loaded, the company was faced with no alternative but to discontinue Zapmail, Bosomworth maintained. “When the packet network became fully loaded, Federal Express discovered, to its astonishment, it was still losing money hand over fist,” he claimed. The software in the Zapnet nodes precluded the expansion of the slow packet net.

Bosomworth claimed even offering the service over the Vsat net in future years would not have saved Zapmail.

“Offering the service over the Vsat network would not make sense. The volume of traffic needed to justify the Vsat net was far in excess of what Federal Express could realistically expect to have generated by the time the Vsat network became operational.”

In a move designed to stimulate demand for Zapmail, Federal Express slashed the base document transmission cost from $35 to $25 just a few months after Zapmail's christening in July 1984.

Calendar

Oct. 6-7, Boston — The System 38: Key to IBM's Mid-Range Strategy. Also, Dec. 18-19, Chicago. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

Oct. 6-9, Scottsdale, Ariz. — Telecom West Conference and Exposition. Contact: Arizona State University, College of Engineering and Applied Sciences, Center for Professional Development, Tempe, Ariz. 85287.

Oct. 6-10, Orlando, Fla. — FOC/LAN 86: The Tenth International Fiber-Optics Communications and Local-Area Networks Exposition. Contact: Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

Oct. 7-9, New York — Computer and Communications Security '86. Contact: Robin Schmidt, Cahners Exposition Group, 1350 E. Touhy Ave., P.O. Box 5060, Des Plaines, Ill. 60017.

Oct. 7-10, San Francisco — Dexpo West 86: The Tenth National DEC-Compatible Exposition. Contact: Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

Oct. 14, New York — Prospects for Communications. Contact: Gartner Group, Inc., 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

Oct. 14, Atlanta — Satellite Data Communications Seminar. Contact: Xerox Computer Services, 5310 Beethoven St., Los Angeles, Calif. 90066.

Oct. 14-15, Long Beach, Calif. — Third Annual Western Telecommunications Expo. Contact: GTE, 5225 Wiley Post Way, Lakeside Plaza 2, Salt Lake City, Utah 84116.

Oct. 14-16, Atlanta — Telemarketing and Business Telecommunications 1986. Contact: Technology Marketing Corp., One Technology Plaza, Norwalk, Conn. 06854.

Oct. 15-16, Dallas — Principles and Applications of Local-Area Networks. Also, Dec. 11-12, Washington, D.C. Contact: LighTech, Inc., Suite 515, 2116 E. Arapaho, Richardson, Texas 75081.

Oct. 16-18, London — ICA Transatlantic Seminar. Contact: International Communications Association, Suite 710, LB-89, 12750 Merit Drive, Dallas, Texas 75251.

Oct. 16-17, Denver — Writing and Using Macros for Lotus 1-2-3. Also, Oct. 30-31, Chicago; Nov. 13-14, Kansas City, Mo. Contact: The American Institute, Carnegie Building, 55 Main St., Madison, N.J. 07940.

Oct. 19-22, Toronto — 1986 International Telecommunications Energy Conference. Contact: Norman S. Siomra, C&D Power Systems, 9 Bradwick Drive, Concord, Ontario L4K 2T4.

Oct. 21, Newton, Mass. — Operating Systems and Portability. Contact: Association for Women in Computing, P.O. Box 68, Newton Upper Falls, Mass. 02164.

Oct. 21-22, Newport, R.I. — Newport Conference on Fiber-Optic Markets. Contact: Kessler Marketing Intelligence, America's Cup Ave. at 31 Bridge St., Newport, R.I. 02840.

Oct. 22-23, Washington, D.C. — Telecommunications Today: Policies, Market Structure, Developments. Also, Nov. 12-13, Denver. Contact: Telecommunications Course, Federal Communications, Inc., 1120 20th St., N.W., Washington, D.C. 20036.

Oct. 22-25, Washington, D.C. — International Computers and Communications 1986 to 2000: Imperatives for Nations and Businesses. Contact: IC&C, P.O. Box 17392, Washington, D.C. 20041.

Oct. 27, Anaheim, Calif. — Teleconferencing: Steps to Take, Moves to Make. Contact: National University Teleconference Network, 332 Student Union, Oklahoma State University Campus, Stillwater, Okla. 74078.

Oct. 27-28, Bethesda, Md. — Postdivestiture Tariffs and their Impact on Large Networks. Contact: The Aries Group, Inc., Suite 320, 1500 Research Blvd., Rockville, Md. 20850.

Oct. 27-29, Boston — Audiotex. Contact: Online International, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

Oct. 28-29, Washington, D.C. — The Fowler Challenge: Deregulation and Competition in the Local Telecommunications Market. Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

Oct. 29, San Jose, Calif. — Token-Ring Vendor Forum. Contact: Network Strategies Group, 1435 Koll Circle, San Jose, Calif. 95112.

Oct. 30-Nov. 1, Miami — South Florida Computer & Business Equipment Showcase. Contact: The Interface Group, Inc., 300 First Avenue, Needham, Mass. 02194.

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▶ COMPARATIVE REVIEW

The 3174 strives for status quo

IBM outdoes itself, but competitors walk away as the uncontested victors.

BY JOHN J. HUNTER
Contributing Writer

Now that the telecommunications industry has had a chance to digest IBM's new 3174 product line, the general consensus is that it is not, as rumored, a revolutionary product that will bury 3270-compatible vendors.

The 3174 Subsystem Control Unit merely allows the IBM product to gain some degree of parity with its competitors, including the ITT Courier Series 9000, Lee Data Corp. Models 300/400 and Telex Computer Products, Inc. 270 product lines. Those competitors offer facilities only dreamt of by IBM users.

The rumored local processing and multihost 3270 controller communications capabilities did not materialize in the 3174. Also, instead of supporting 128 physical devices, as was anticipated, the 3174 retains the old 3274 limit of 32 devices.

However, the new controller does deliver an optional protocol converter adapter that allows IBM terminals to emulate Digital Equipment Corp. VT 100 and IBM 3101 terminals. It will also enable the terminals to communicate with Ascii host applications and public data networks. The same adapter lets an Ascii terminal or printer emulate a 3270 device and access 3270 applications.

Personal computers emulating any of the supported Ascii displays can be used with the 3174. Also announced for the 3174 was a local-area network interface that will mate it with IBM's Token-Ring Network, increased internal storage — from 192K bytes to 1M byte — a 1.2M-byte diskette drive as well as terminal and controller adapters that allow twisted-pair telephone wires to be used in lieu of coaxial cable.

The 3174 product line comprises seven different cluster controllers: the Models 1L, 1R, 2R, 3R, 51R, 52R and 53R. These units replace the three-year-old Models 41A, 41C, 41D and 61C controllers. They are alleged to have faster internal speeds than the old controllers, and they are also less expensive.

Models 1L, 1R, 2R and 3R are large-scale units supporting up to 32 IBM 317X and 327X terminals or printers. The other three units can interface as many as 16 terminals.

The Ascii terminal option on Models 1L, 1R, 2R and 3R supports up to 24 ports; the 51R and 52R each support eight ports. Ascii ports are in addition to the non-Ascii ports accommodated; however, only 32 ports can be active at once.

Model 1L, which replaces models 41A and 41D, is a local-attached controller that operates in Systems Network Architecture and local mode for virtual storage.

Model 1R is a remote cluster controller replacement for Model 41C, and it supports SNA/Synchronous Data Link Control (SDLC) and Binary Synchronous Communications (BSC) as well as RS-232-C/CCITT V.24 and V.35 interfaces.

In addition, an X.25 interface, which was optional on the 41C, is standard equipment on the 1R.

Models 2R and 3R differ from the 1R in the types of interfaces supported. The 2R has a CCITT X.21 interface, while the 3R uses an IBM Cabling System interface. This allows it to attach to IBM's Token-Ring Network. However, Model 3R will not be available until May 1987.

Models 51R, 52R and 53R are 3274 Model 61C replacements. Like the 61C, Model 51R supports RS-232-C/CCITT V.24 and V.35 interfaces in addition to SNA/SDLC and BSC protocols.

The new unit, however, has X.25 as standard equipment. Models 52R and 53R, respectively, have the same interfaces as Models 2R and 3R. The 53R also will not be available until May.

IBM has also increased the standard data communications speeds on the 3174. BSC still runs at 9.6K bit/sec, but SNA/SDLC with an RS-232-C interface transmits at 19.2K bit/sec.

With the V.35 now standard equipment, the top SNA/SDLC transmit speed is 64K bit/sec. The Dataphone Digital Service adapter is not available with the 3174.

The 3174 was announced with a lot of promissory notes for new products, most due within the first quarter or first half of next year.

Among the big ones are the previously described asynchronous emulation, which is due the second half of 1987, and an IBM Token-Ring Network 3270 Gateway, due next March. The latter is an option for the Model 1L operating in SNA mode, and it supports up to 140 Token-Ring attached devices.

One significant feature of the 3174 is the coaxial-to-telephone twisted-pair adapter (CTPA) for use with Model 1L, 1R, 2R and 3R controllers. CTPA permits terminals to attach to the controller via twisted-pair telephone wire, obviating the need for long coaxial cable runs. The CTPA interfaces with the coaxial cable from the terminal and converts terminal output to a form suitable for twisted-pair wire. A CTPA is also needed at the controller end.

IBM has also enhanced the 3299 terminal multiplexer to provide the same twisted-wire support. Model 3, introduced with the 3174, connects to the controller via coaxial cable or shielded twisted-pair wires, but has an RJ-11 jack for interfacing terminals.

Users can connect the terminals via a CTPA and use internal telephone wiring to transmit data. It's a nice feature, and none of IBM's competitors have it.

Competing controllers

The principal competition for the 3174 is the ITT Courier 9000 Series, the Lee Data 300/400 product line and the Telex 270.

All products are about equal in the areas of 3270-mode terminal/printer accommodation and types of protocols and data transmission speeds supported.

They differ in the number of 3270-mode transmission lines supported; in local, non-personal computer applications processing facilities offered and the way in which asynchronous terminal support is implemented.

IBM offers an asynchronous emulator adapter for the 3174 that permits its terminals to emulate a 3101 or VT 100 and communicate through the controller with Ascii hosts. Up to 24 such host connections can be established.

The adapter also permits these Ascii terminals to emulate 3270 terminals. When operating in Ascii emulation mode, operators toggle between 3270 and Ascii mode through keyboard commands.

Like the 3174, Lee Data supports dual-mode operation. It also provides Ascii terminal emulation with its Model 400 controllers and Model 1214 and 1221 displays.

Lee Data, however, does not permit the use of Ascii terminals with its controllers. This could prove to be a marketing mistake for the same reason that it was a smart move for IBM.

ITT Courier and Telex are in the same boat. Telex allows its terminals to emulate Ascii terminals in about the same fashion as Lee Data.

ITT implements Ascii terminal emulation by equipping its 9000 Series terminals with an asynchronous option called VTC. VTC is a printed circuit card that plugs into the terminal, provides DEC VT 100 emulation and furnishes an RS-232-C interface for connecting a modem.

Users can thus establish public or private links to Ascii hosts and toggle back and forth between 3270 and Ascii mode.

With the 3174, users are still saddled with a single-link BSC as well as SNA/SDLC communication modes. While this was adequate in the past, the move toward distributed processing has made single-link systems obsolete.

Lee Data and Telex recognized that years ago, and they offer products with dual remote-host communications facilities. Lee's Models 321 and 421 both have separate links for local and remote host connection. Telex offers dual remote host communications with its 174 and 274C controllers. ITT Courier has no multiple-link facility.

Another 3270 shortcoming carried over to the 3174 is the lack of local applications-processing facilities. Unless personal computers are used, all processing must be handled by the host processor.

Both Lee Data and ITT Courier have remedied this problem with local processors. Both employ the Xenix operating system and have 1M byte of random-access memory, with expansions available and hard-disk storage. These processors can be used for many local processing applications such as data base management.

ITT Courier's local processor, the Applications Processor, employs its 942X/94XX cluster controllers to interface with the host processor. Lee Data's unit, the Series 600 Associated Processor, works with Model 400 cluster controllers.

The 3174 does little more than move IBM into the same ballpark as the rest of the major 3270-compatible vendors. The others offer the same interfaces, same data transmission speeds and terminal support as IBM's 3174, and all had terminal coaxial multiplexers long before Big Blue.

Furthermore, IBM has yet to match the multihost communications facilities offered by Lee Data and Telex or the local processing facilities available from ITT Courier and Lee Data.

Aside from IBM's CTPA and more internal storage, which will probably be used to handle protocol conversion and dual sessions for its terminals, the 3174 offers nothing that can't be configured with the existing 3274 product line.

The X.25, X.21 and V.35 interfaces, response-time monitor and the integrated diskette required to install the enhanced file for use with configuration support D are all options for the 3274.

The dual-sessions for the terminals, which have received a great deal of notoriety, actually were offered as a request for price quote on the 3274 last year.

And while Models 3R and 53R for Token-Ring interfacing look interesting, they won't be available until next May.

With the 3174, IBM continues its aggressive pricing stance. Models 1L, 1R, 2R, 3R, 51R, 52R and 53R are priced at $12,950, $9,950, $9,950, $11,450, $5,900, $5,900 and $7,400, respectively.

Of course, components such as the new multifunction Model 3193 and 3194 terminals, the asynchronous emulation adapter, at $2,250 per eight ports, and the optional 3299 terminal multiplexer will run up the cost.

ITT Courier, Lee Data and Telex are currently reviewing their product line prices. If the past is any indication, these prices will typically run 10% to 30% below those of IBM's new offerings. ◘

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